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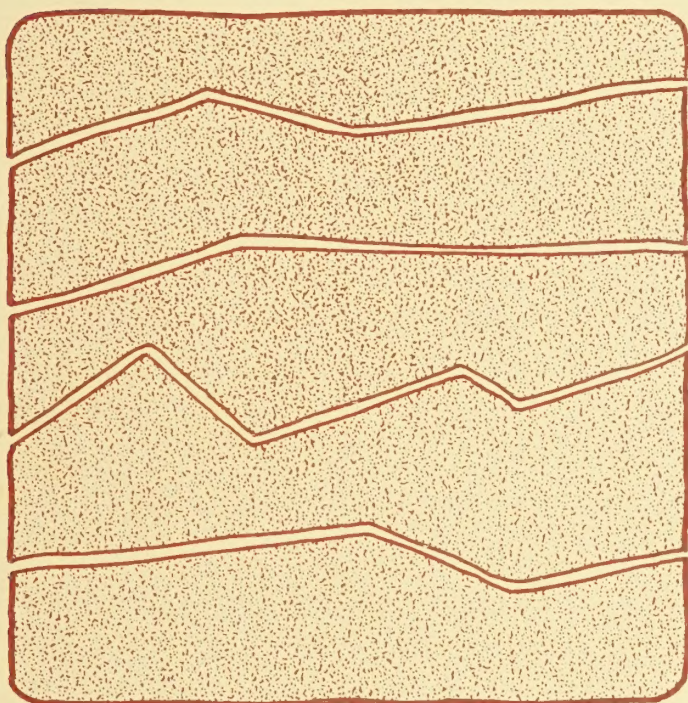
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[6-3] **TRENDS IN JOB FAMILIES
AND EDUCATIONAL ACHIEVEMENT
OF THE ONTARIO LABOUR FORCE**



Ontario



**ECONOMIC PLANNING BRANCH · POLICY PLANNING DIVISION
DEPARTMENT OF TREASURY AND ECONOMICS**



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TRENDS IN JOB FAMILIES AND
EDUCATIONAL ACHIEVEMENT OF THE
ONTARIO LABOUR FORCE

Economic Planning Branch
Policy Planning Division
Department of Treasury and Economics

Hon. Charles S. MacNaughton,
Treasurer of Ontario and
Minister of Economics.

H. Ian Macdonald,
Deputy Minister.

May, 1969

PREFACE

In August 1966, an Interdepartmental Committee on the Economic Analysis of Education Programs met to prepare outlines for a number of research projects. The purpose of the studies was to provide the Ontario Department of Education, as well as other departments of government, with information which would assist them in establishing long-run policy. The analysis in this document focuses primarily on Ontario, but comparative data for Canada has been included in order to draw attention to underlying national trends.

This report was prepared by J. Burkus and is the first in a series of related studies undertaken by the Economic Planning Branch. During 1969, other phases of the same project dealing with projections of output, employment and productivity by industry will be completed and integrated with the findings presented here.

C. P. Honey
Director
Economic Planning Branch

TABLE OF CONTENTS

	Page
Preface	
1. Introduction.....	1
2. Methodology.....	2
3. Trends in Job Families, 1941-1961.....	9
4. The Relative Importance of Job Families and their Industrial Distribution.....	19
5. Projected Changes in Job Families, 1971-1991.....	30
6. Educational Achievement of the Ontario Labour Force.....	36
7. Matrix of Educational Achievement Levels, Industry by Job Family.....	50

LIST OF CHARTS

1. Percentage Change in Total Labour Force and Job Families, Ontario and Canada, 1941-1961.....	11
2. Percentage Change in Total Labour Force and Job Families, Ontario and Canada, 1941-1951, 1951-1961, and 1941-1961.....	14
3. Percentage Distribution of Ontario Labour Force Job Families, 1961.....	26
4. Percentage Distribution of Ontario Labour Force Job Families, Males, 1961.....	27
5. Percentage Distribution of Ontario Labour Force Job Families, Females, 1961.....	28

LIST OF CHARTS (CONT'D)

	Page
6. Trend Line Projections to 1991 of Total Ontario Job Families.....	32
7. Trend Line Projections to 1991 of Ontario Job Families, Males.....	33
8. Trend Line Projections to 1991 of Ontario Job Families, Females.....	34

LIST OF TABLES

1. Ontario Labour Force by Industry, and Industry by Job Family, 1961.....	20
2. Ontario Labour Force, Males, by Industry, and Industry by Job Family, 1961.....	22
3. Ontario Labour Force, Females, by Industry, and Industry by Job Family, 1961.....	23
4. Ontario Labour Force by Job Family, 1941, 1951, 1961 and Projected 1971, 1981 and 1991.....	37
5. Educational Attainment of the Canadian Labour Force 14 Years of Age and Over, 1960 and 1965.....	38
6. Educational Achievement of the Canadian and Ontario Labour Force, 1961.....	39
7. Educational Achievement of the Ontario Labour Force, by Industry, 1961.....	41
8. Educational Achievement of the Ontario Labour Force, by Industry, Males, 1961.....	43

LIST OF TABLES (CONT'D)

	Page
9. Education Achievement of the Ontario Labour Force, by Industry, Females, 1961.....	44
10. Educational Achievement of the Ontario Labour Force, by Job Family, 1961.....	46
11. Educational Achievement of the Ontario Labour Force, by Job Family, Males, 1961.....	48
12. Educational Achievement of the Ontario Labour Force, by Job Family, Females, 1961.....	49
13. Matrix of Industry/Job Family Educational Achievement Levels, Ontario Labour Force, 1961.....	51
14. Matrix of Industry/Job Family Educational Achievement Levels, Ontario Labour Force, Males, 1961.....	52
15. Matrix of Industry/Job Family Educational Achievement Levels, Ontario Labour Force, Females, 1961.....	53
16. Matrix of Industry/Job Family Educational Achievement Levels, Percentage Distribution, Ontario Labour Force, 1961.....	55
17. Matrix of Industry/Job Family Educational Achievement Levels, Percentage Distribution, Ontario Labour Force, Males, 1961.....	56
18. Matrix of Industry/Job Family Educational Achievement Levels, Percentage Distribution, Ontario Labour Force, Females, 1961.....	57

APPENDIX TABLES

		Page
A-1	Matrix of Industry/Job Family Educational Achievement Levels, Canada Labour Force, 1961.....	58
A-2	Matrix of Industry/Job Family Educational Achievement Levels, Canada Labour Force, Males, 1961.....	59
A-3	Matrix of Industry/Job Family Educational Achievement Levels, Canada Labour Force, Females, 1961.....	60
A-4	Matrix of Industry/Job Family Educational Achievement Levels, Percentage Distribution, Canada Labour Force, 1961.....	61
A-5	Matrix of Industry/Job Family Educational Achievement Levels, Percentage Distribution, Canada Labour Force, Males, 1961.....	62
A-6	Matrix of Industry/Job Family Educational Achievement Levels, Percentage Distribution, Canada Labour Force, Females, 1961.....	63

TRENDS IN JOB FAMILIES AND EDUCATIONAL
ACHIEVEMENT OF THE ONTARIO LABOUR FORCE

1. Introduction

The process by which growth occurs has been one of the most important subjects of enquiry in economics.

In recent years, a number of economists have turned their attention from the traditional analysis of the physical inputs of capital, land and labour to an examination of the relationship between education and economic growth.⁽¹⁾ While education is desirable for many reasons other than its contribution to economic growth, this study is concerned with exposing some of the changing interrelationships between educational levels, occupational content and industrial distributions of the labour force.

In order to maximize economic growth, minimize unemployment and improve the operation of the labour market, the levels of education and training of the labour force should correspond to present and anticipated demands. This is a goal toward which those concerned with educational planning should strive. It is hoped that this study will contribute to the attainment of that goal.

This report examines the nature of changes in job families and

(1) See as examples G.W. Bertram's study The Contribution of Education to Economic Growth, Staff Study No. 12, Economic Council of Canada, June, 1966, and O.J. Firestone's Industry and Education: A Century of Canadian Development, Ottawa: University of Ottawa Press, 1969, Part II.

provides an indication of current and future educational achievement levels for the Ontario labour force. Some data on the Canadian labour force have also been included in order to provide a broader frame of reference. For the period 1971-1991, estimates have been prepared of the anticipated number of persons in the various job families as well as the educational requirements for these families.

2. Methodology

The approach taken was to convert civilian labour force data into a job content format. This format is outlined in The Job Content of the Canadian Economy 1941, 1951, and 1961, - a study carried out for the Dominion Bureau of Statistics, Census and Labour Divisions, by J.G. Scoville. Here, the labour force data for the Census years 1941, 1951 and 1961 were analyzed in terms of job content. A review of the above study plus the original thesis⁽¹⁾ and a related publication, The Job Content of the Canadian Economy 1941-61, by Sylvia T. Wargon⁽²⁾ indicated that the methodology would be useful as a starting point for this study.

The occupational data which are classified by major industrial

(1) J.G. Scoville, The Job Content of the U.S. Economy, 1940-1970: An Attempt at Quantification (a thesis presented to the Department of Economics, Harvard University, Cambridge, Mass., 1964).

(2) Technical Memorandum (General Series) No. 12 DBS, Census Division, Ottawa, 1966.

divisions in the Canadian Census have previously been found to be non-representative of the jobs that people actually do. In the analysis of social and economic problems,

"...there is, and long has been, a real need for statistics showing in summary form an occupational distribution of the Nation's labour force - a need for statistics that cut across industry lines and bring together... (a family) of occupationally homogeneous groups...".⁽¹⁾

An industrial break-down of the labour force which classifies workers according to a series of end products is unsatisfactory for our purposes because it does not reveal the technical orientation of the various types of jobs performed.

Since Census occupational data does not tell us the particular type of function performed or service rendered, it was felt that these statistics would have a low transfer value in determining the ability, training, and skills that future workers will require to match the types of jobs then available. Thus, the occupational classifications in the Canadian Census have been regrouped into a somewhat different and more amenable format.

This study employs the job content approach developed by Scoville. Labour force data have been reclassified into 18 job families in such a way that the occupations within each job family are

(1) Comparative Occupational Statistics for the United States, 1870-1940, U.S. Bureau of the Census, 1943, p. 175, quoted in J.G. Scoville, The Job Content of the U.S. Economy.

as homogeneous as the data permit. As Scoville explains,

"A job family is principally defined by the material, equipment or functions about which the jobs in it are centered. In the analysis of job content, it is highly important to determine the focus of the job. The content of the job depends on a whole host of factors about which this sort of question can be asked; does the job involve handling materials, tools, machines, money or dealing with people? Such technical considerations determine in large degree the skills, effort, responsibilities and other attributes required by a job."(1)

Moreover, the occupations included within each job family are related to one another by several characteristics which themselves may prove useful in the areas of worker training, mobility and wage structure. These characteristics, which underlie the basic homogeneity of each job family, are promotion, substitutability, and transferability. They have been used to determine the number and scope of the occupational classifications employed in this study.

Each job family contains broad avenues of promotion: "A common technical focus will characterize jobs at different levels of the promotional ladder."(2) Furthermore, each job family is characterized by the range of jobs that a person can perform (transferability) or the range of persons who can perform a job (substitutability). Thus,

(1) J.G. Scoville, The Job Content of the US Economy, pp. 48-49.

(2) Ibid., p.55.

whether members of the labour force have narrowly specialized skills or, alternatively, more widely applicable skills, the determination of substitutability or transferability is particularly relevant to the consideration of problems associated with changes in the job structure.

The job structure scheme developed by Scoville recognizes that within the plant, or unit of operation, there exist clusters of families of jobs that are focused on a department, process or machine and are likewise connected by educational and training requirements. Logically, job families could be created on the aggregate level by summing the job clusters found at the plant level. However, it is practically impossible, because of the limitations of labour force data, to estimate the microeconomic families as aggregates of the microeconomic clusters. The families developed by Scoville represent a trade-off between a desire to develop groupings that are meaningful for study and the fact that present Census data are suitable only for the construction of broad families. Some examples of the occupations included in the 18 job families used in this study are given below.⁽¹⁾

1. Tools - Specialized

e.g., shoemakers, plasterers, tailors, longshoremen

2. Tools - Non-specialized

e.g., welders, boilermakers, furniture makers

(1) This discussion closely follows J.G. Scoville, The Job Content of the Canadian Economy, 1941, 1951 and 1961, DBS, Special Labour Force Studies No. 3, pp. 8-9.

3. Machines and Equipment - Specialized

e.g., construction equipment operators, mine labourers, millers

4. Machines and Equipment - Non-specialized

e.g., rolling mill operators, cranemen, temperers

'Tools' encompass those instruments normally included under that title as well as smaller machines for which one man is responsible: 'Machines' generally involving longer processes and numerous inter-related jobs. The 'Tools' and 'Machines' families were divided into specialized and non-specialized jobs - the first group of jobs is narrowly specialized by industry or function, whereas non-specialized jobs have a relatively wide range of applicability.

5. Inspection

e.g., foremen, inspectors, graders

6. Vehicle Operation

e.g., truck drivers, taxi drivers, driver-salesmen

7. Farm

e.g., farmers, stockraisers, farm labourers

8. Sales - Considerable Knowledge Required

e.g., insurance agents, real estate agents, security salesmen

9. Sales - Considerable Knowledge Not Required

e.g., sales clerks, news vendors, canvassers

The focus of job families 8 and 9 is on selling, but the first class of jobs requires a more detailed knowledge of product characteristics, whereas job family 9 is focused more on the act of selling itself.

10. Clerical

e.g., accountants, stenographers, typists, telephone operators, postmen

11. Personal Service

e.g., housekeepers, cooks, barbers, waiters

12. Entertainment

e.g., artists, music teachers

13. Protection

e.g., firemen, guards, policemen

14. Education and Training

e.g., professors, teachers

15. Health

e.g., physicians, pharmacists, nurses

16. Welfare

e.g., clergymen, social welfare workers

17. Administration and Organization

e.g., managers, lawyers, computer programmers

18. Research and Design

e.g., engineers, scientists, architects,
economists, draughtsmen

In order to provide some insight into the educational requirements of the various occupations in the economy, the job family format includes a percentage distribution showing educational achievement. Unfortunately, since the available data with respect to educational attainment levels are somewhat incomplete in the Census, it was found necessary to use an approach which is not as theoretically

satisfying.⁽¹⁾ For example, there are no figures which show the educational achievements of the Ontario labour force by age groups. As a result, the Canadian data - which probably understate the attainment levels of the Ontario labour force - had to be applied to the Ontario analysis. Moreover, a percentage distribution of job families by educational achievement could only be computed for the 1961 Census data. This meant that a time series could not be constructed and the research perforce focused on cross sectional analysis.

In order to compensate for these data limitations, the educational achievement levels of the Canadian labour force aged 25 - 34 were assumed to represent the average educational achievement of new entrants to the labour force. Since the 25 - 34 age group has a higher educational achievement than the labour force as a whole, the choice of this age group helps to compensate for the data constraints described above. The characteristics of the 25 - 34 age group can be also interpreted as suggesting the direction in which the total labour force is heading and thus approximate the trend line that cannot be constructed.

(1) Tabulations in this study are based on the 1961 Census Population Questionnaire which asked, "What was the highest grade or year of schooling you ever attended?".

As a result of changing Census definitions an accurate time series cannot be developed. Occupational data in the Census years prior to 1961 are not completely comparable to the 1961 Census figures. Only the 1941 and 1951 Census data can reasonably be compared with the 1961 occupational data, and even here some differences of definition and classification exist. The differences did not preclude some 1941-1951-1961 comparisons. In any event there are only three fairly comparable Census years. The first (1941) is hardly a suitable base year. Thus, a completely reliable time series cannot be constructed. Another problem arises from the fact that the Census gives no information on post-secondary education other than university.

Notwithstanding the data limitations, this study can make several important contributions to educational planning. The occupational classifications by job families that have been developed are as homogeneous as the data permit. They provide meaningful breakdowns of the census data. The distribution of the labour force by technical focus and by educational achievement serves the two broad aims of providing a basis for useful analysis of training and educational requirements and shedding light on patterns of occupational mobility.

3. Trends in Job Families, 1941 - 1961

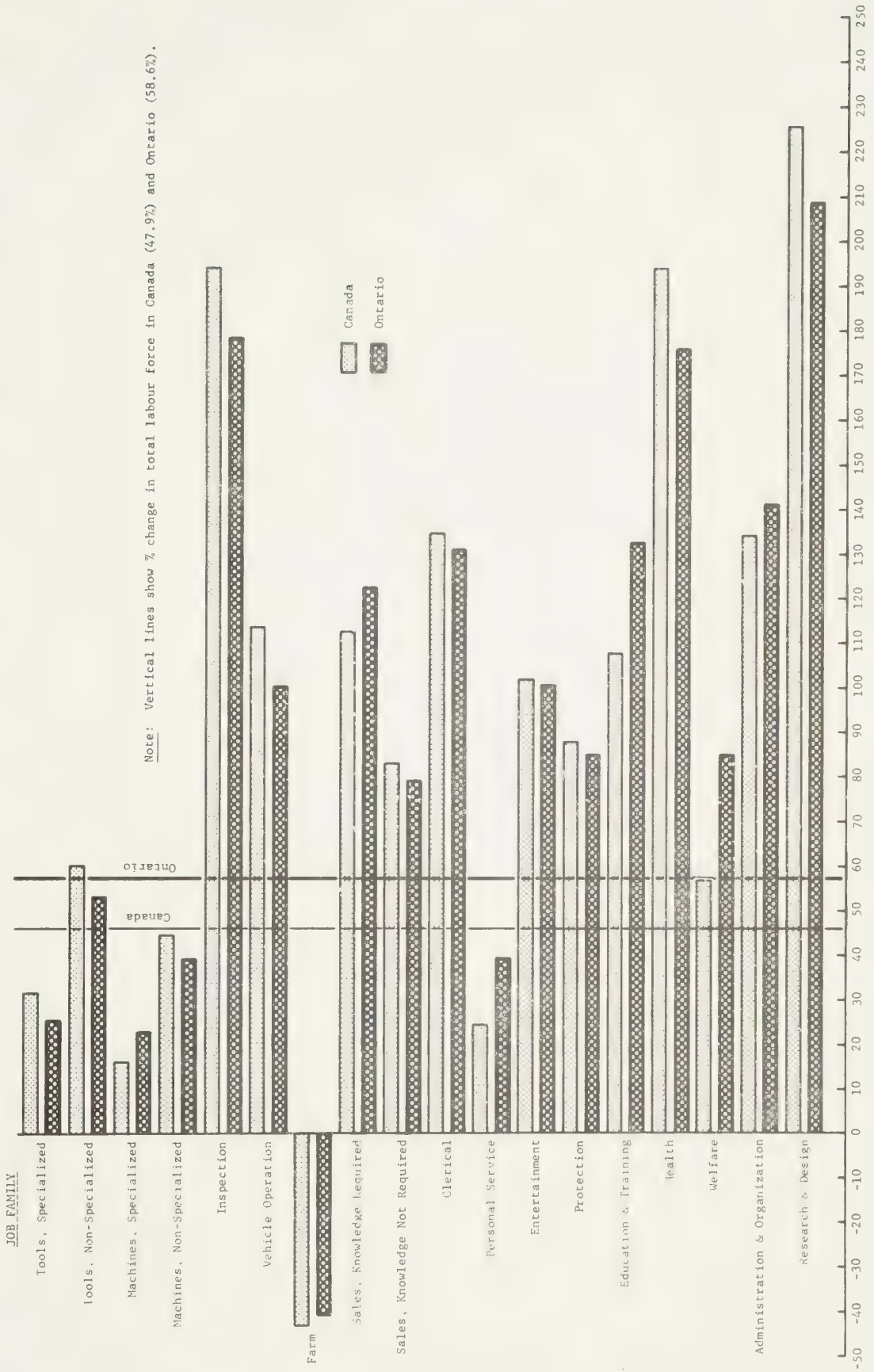
This section examines the extent to which changes have occurred in each of the 18 job families in both Ontario and Canada.

Chart I illustrates the developments during the two decades 1941-1961. It has not been possible to show changes over a longer time span because earlier Census data are not comparable.

In order to facilitate the analysis, the data have been grouped into four categories: job families which increased at a rate significantly greater than the labour force; job families which increased at or about the same rate as the labour force; those which exhibited little or no change relative to the change in the size of the labour force; and those job families which declined absolutely during the period under review.

Chart I shows the rate of change over the period 1941-1961 in each job family and indicates that the groups showing growth significantly greater than the labour force were the inspection, health, research and design job families. In 1961 these job families taken together accounted for about 211,000 persons in the Ontario labour force. In both Canada and Ontario these job families exhibited rates of growth about three to four times greater than the overall change in the size of the labour force. Each of these three job families in the Canadian labour force grew at a faster rate than the comparable job family in the Ontario labour force. One explanation is that the proportion of persons in each of these job families relative to the total labour force was smaller in Canada than in Ontario in 1941. Despite the more rapid growth of these job families in Canada, the proportion of workers to the total labour force in

CHART 1
PERCENTAGE CHANGE IN TOTAL LABOUR FORCE AND JOB FAMILIES, ONTARIO AND CANADA, 1941-1961.



Source: J.C. Scoville, *The Job Content of the Canadian Economy, 1941, 1951 and 1961*, DBS, Special Labour Force Studies No. 3.

each job family remained greater in Ontario in 1961. Although these three job families exhibited the highest rate of growth between 1941 and 1961, taken together they accounted for only 9.2 per cent of the Ontario labour force and 8.2 per cent of the Canadian labour force in 1961.

Other job families which grew at rates appreciably greater than the labour force as a whole were: vehicle operation (117,000);⁽¹⁾ sales - considerable knowledge of product required (59,000); sales - little knowledge of product required (124,000); clerical (369,000); entertainment (12,000); protection (30,000); education and training (61,000); welfare, Ontario (13,000); and administration and organisation (219,000).

Job families which showed changes between 1941 and 1961 that were about the same as changes in the total labour force included tools - non-specialized (393,000); machines - non-specialized (207,000); and welfare, Canada.

Tools - specialized (99,000), machines - specialized (53,000), and personal service (160,000) job families all increased at less than average rates in Ontario and Canada during the period under review.

(1) Figures in brackets show Ontario totals in 1961 rounded to the nearest thousand.

The farm job family (160,000) experienced an absolute decline from 1941 to 1961. In Ontario, this job family declined by 40.6 per cent - somewhat less than the 42.8 per cent decline in Canada.

The rates of change in each of the 18 job families during each decade and for the 20 year period (1941-1961) are shown in Chart 2. The earliest year for which comparable data are available is 1941 and it is recognized that this is not an ideal base year because of the distortions of World War II.

As in Chart I, there are marked divergences in the rates of change among various job families. Generally, production-oriented job families tended to increase at a faster rate during the decade 1941-1951 than during the more recent period. Examples are : tools- specialized, tools - non-specialized, machines and equipment - non-specialized. In both Ontario and Canada, these job families failed to grow as rapidly as the labour force as a whole during the second decade. Inspection, vehicle operation, sales - considerable knowledge, clerical, and administration and organization job families also displayed lower rates of increase during the 1951-1961 period than during the earlier decade.

The machinery and equipment - specialized job family declined absolutely in Ontario between 1941 and 1951. In the subsequent decade, however, this job family increased at a greater rate than the growth of Ontario labour force. Two other job families experienced net declines during one, or both, of the ten-year time periods shown in Chart 2.

CHART 2

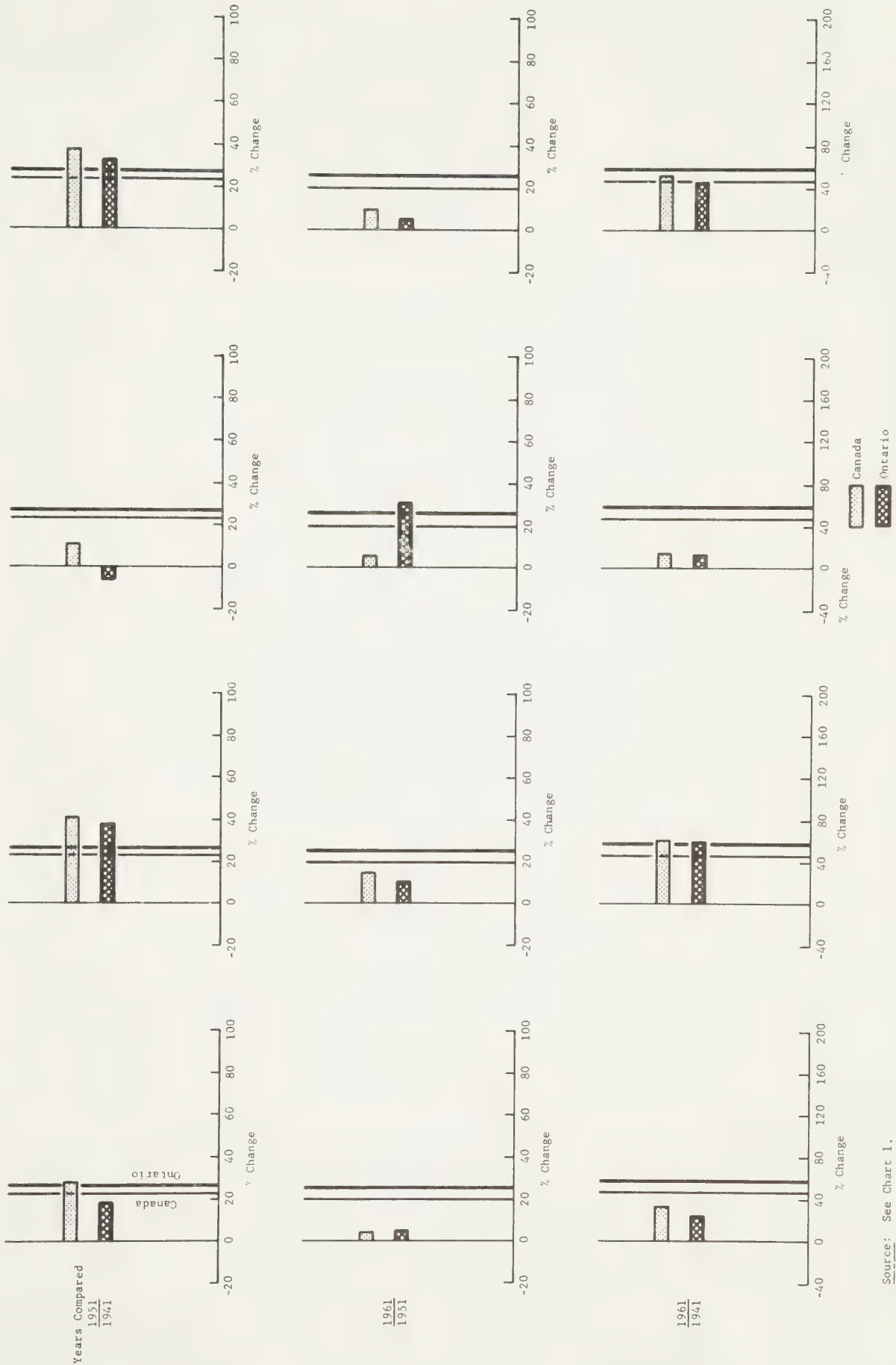
PERCENTAGE CHANGE IN TOTAL LABOUR FORCE AND JOB FAMILIES, ONTARIO AND CANADA, 1941-1951, 1951-1961 AND 1941-1961.

1. TOOLS, SPECIALIZED

2. TOOLS, NON-SPECIALIZED

3. MACHINES & EQUIPMENT, SPECIALIZED

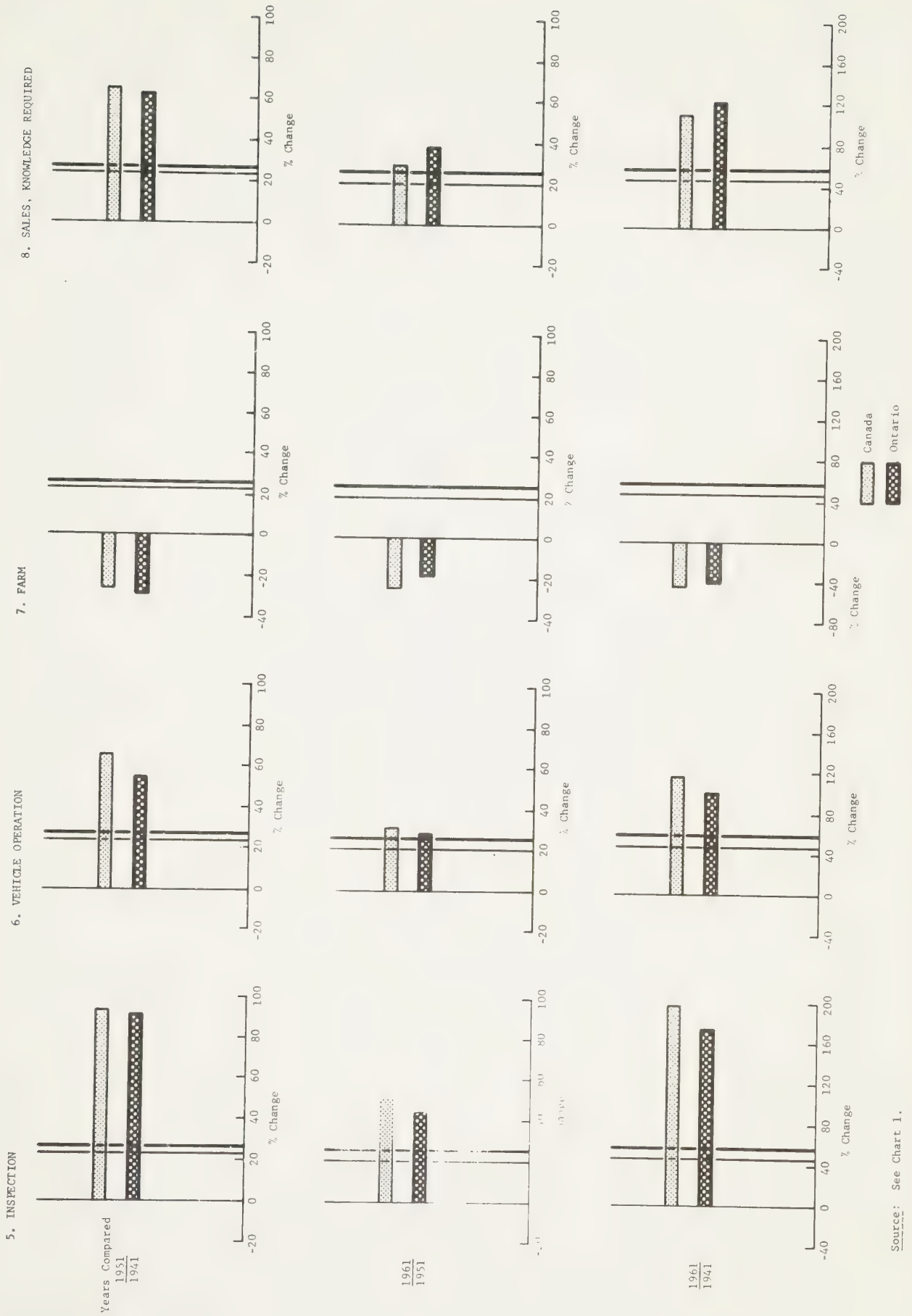
4. MACHINES & EQUIPMENT, NON-SPECIALIZED



Source: See Chart 1.

Note: Vertical lines show % change in total labour force in Canada and Ontario.

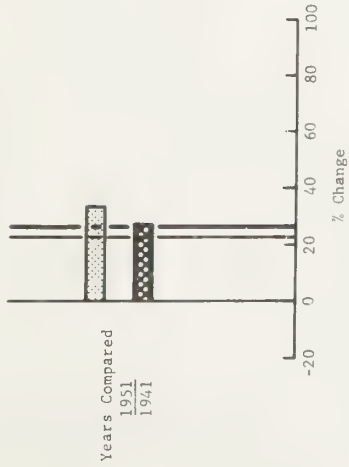
CHART 2 (cont'd.)



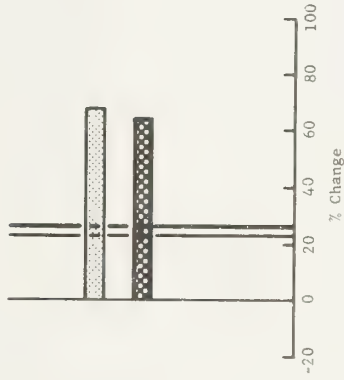
Source: See Chart 1.

CHART 2 (cont'd.)

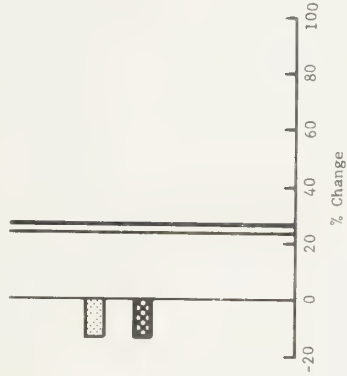
9. SALES, KNOWLEDGE NOT REQUIRED



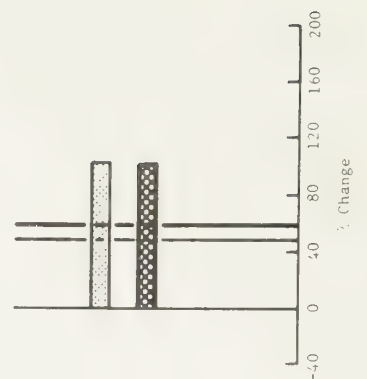
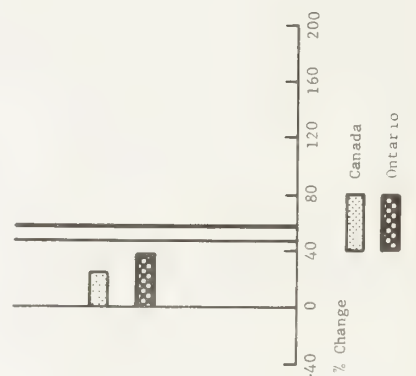
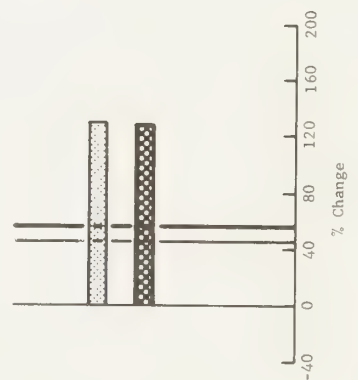
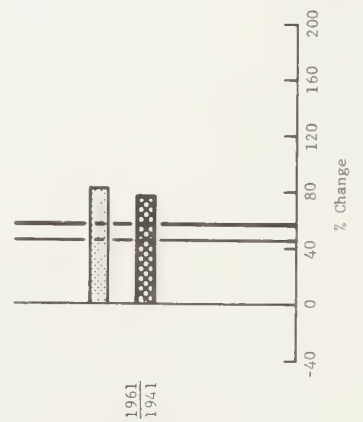
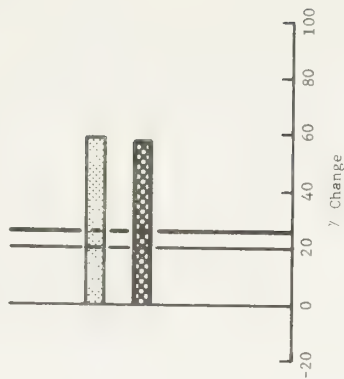
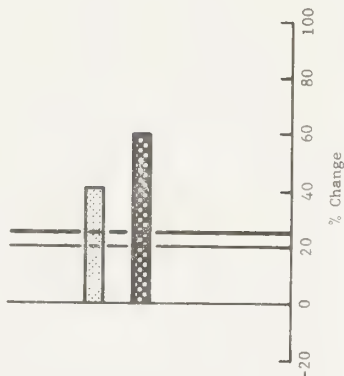
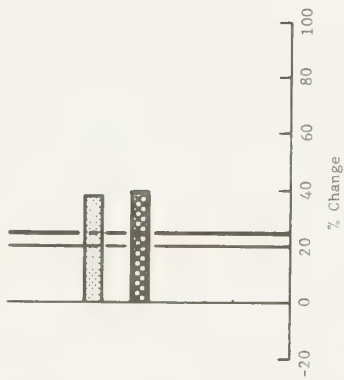
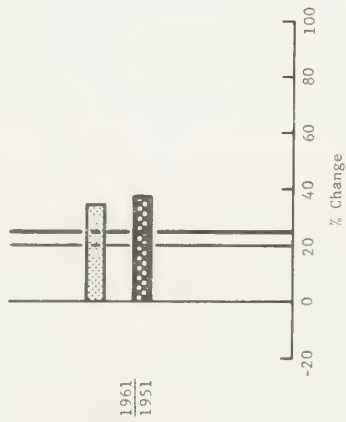
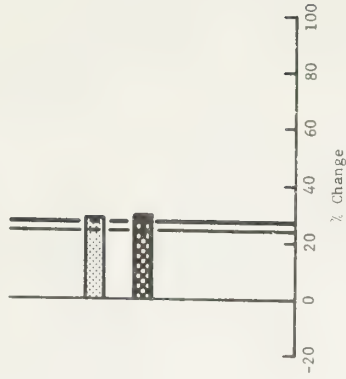
10. CLERICAL



11. PERSONAL SERVICE

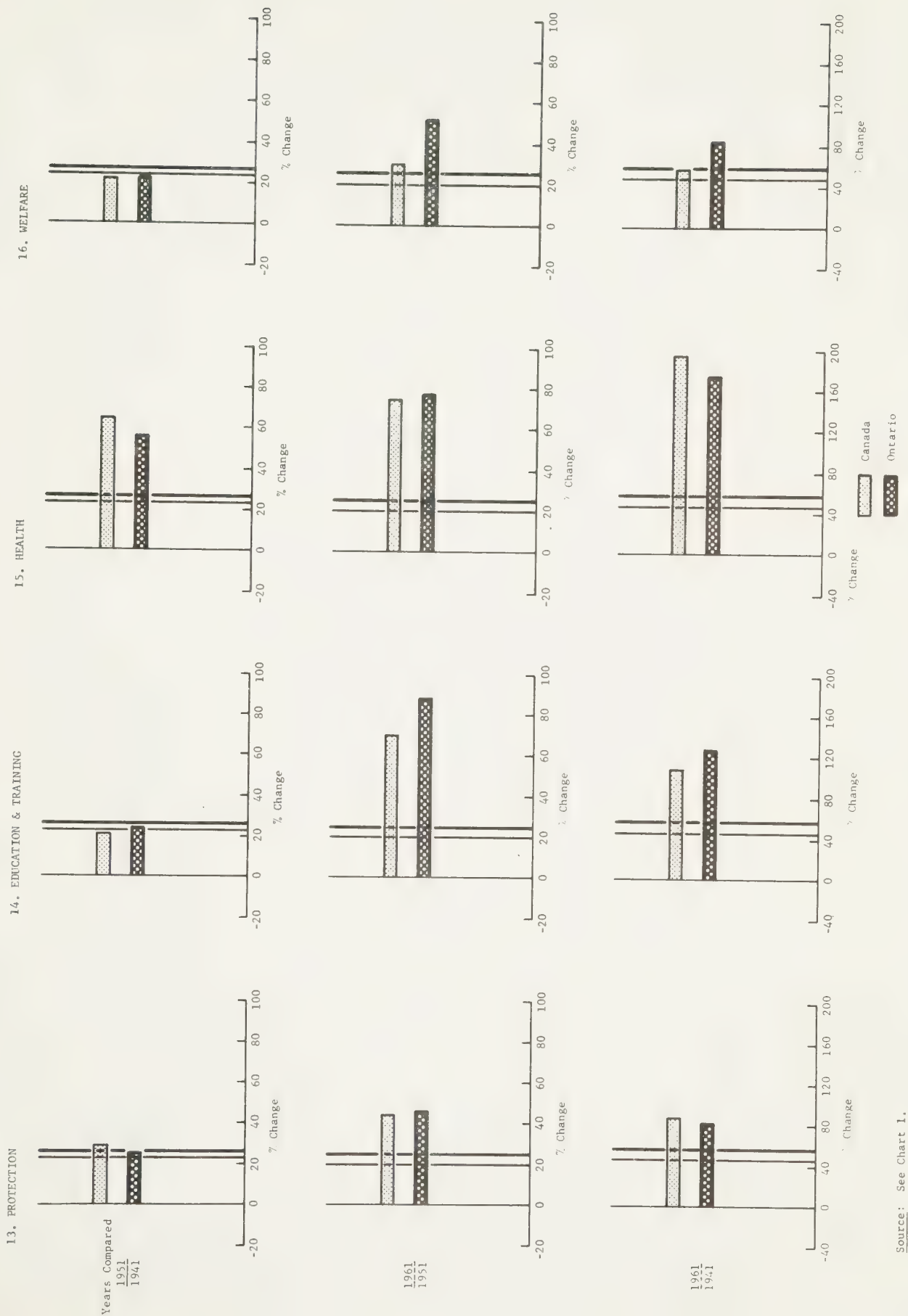


12. ENTERTAINMENT



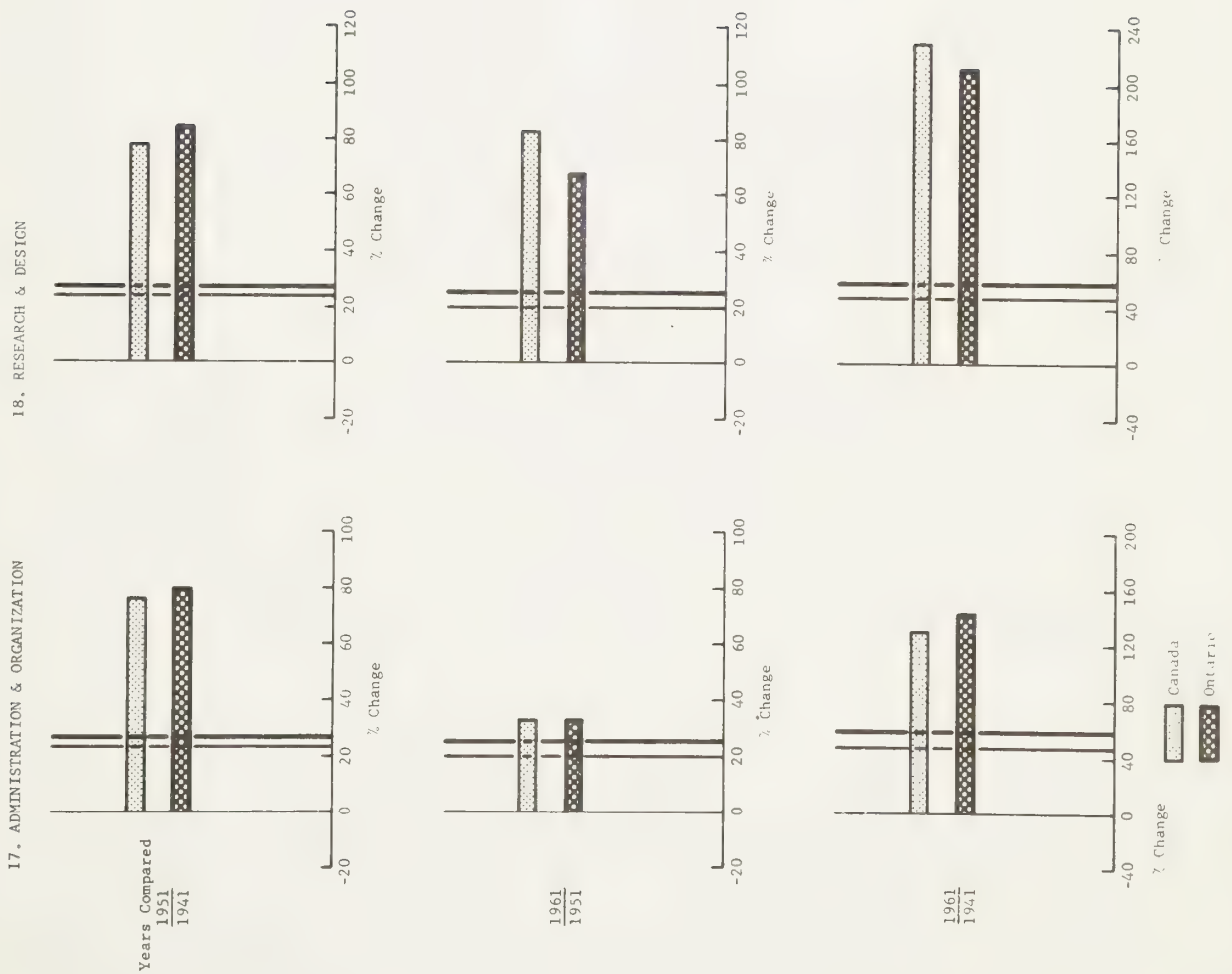
Source: See Chart 1.

CHART 2 (cont'd.)



Source: See Chart 1.

CHART 2 (cont'd.)



Source: See Chart 1.

Ontario and Canada had absolute declines in the farm job family. The personal service job family declined in the period 1941-1951, but during the subsequent decade grew about twice as fast as the labour force as a whole. Other job families which grew markedly faster during the more recent decade include entertainment, protection, education, health and welfare.

Finally, a word of caution is in order. The extent to which rapid growth in the first decade can be attributed to a return to a normal civilian economy is impossible to determine and these forces cannot be clearly isolated from the long-term trends.

4. The Relative Importance of Job Families and their Industrial Distribution

The charts in the previous section illustrated the changes which occurred in the job families over the period 1941-1961. Since the job family/industry matrix contains a large number of boxes, the analysis in this section will focus on the key characteristics of the matrix computed for 1961.

Table I⁽¹⁾ shows both the absolute and relative distribution of the Ontario labour force by industry, and industry by job family. The first two columns indicate that the manufacturing group accounted for the largest proportion of the Ontario labour force - 27.9 per cent.

(1) Since data in most of the tables shown are the product of a number of transformations, totals may not add due to rounding.

TABLE 1

ONTARIO LABOUR FORCE BY INDUSTRY, AND INDUSTRY BY JOB FAMILY, 1961

Industry	Agriculture		Forestry		Fishing and Dredging		Mining, Quarries, and Oil Wells		Manufacturing		Construction		Transportation, Communication, and Other Utilities		Trade		Finance, Insurance, and Real Estate		Community, Business, and Personal Services		Public Administration		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Labour Force	168,805	7.4	17,444	0.7	2,108	0.1	42,184	1.8	638,584	27.9	152,094	6.7	193,859	8.5	368,216	16.1	97,665	4.3	464,810	20.3	140,410	6.2	2,285,912	100.0
Tools - Specialized	104	0.1	8,864	30.3	29	1.4	600	1.4	34,129	5.3	14,806	11.0	13,489	7.1	6,197	1.7	137	0.1	15,955	3.4	2,172	1.5	98,701	4.3
Tools - Non-specialized	829	0.5	2,153	12.2	149	7.1	7,215	17.1	167,835	23.2	89,622	58.6	34,077	17.6	60,913	16.3	3,564	3.7	29,081	6.3	20,180	14.4	392,419	17.2
Machines - Specialized	25	-	350	2.0	1,324	62.8	21,837	51.8	13,943	2.2	7,109	4.7	3,318	1.7	1,096	0.3	32	-	1,876	0.4	2,110	1.5	53,020	2.3
Machines - Non-specialized	342	0.2	232	1.3	375	17.8	2,022	4.8	172,479	27.0	5,540	3.6	3,032	1.6	14,309	3.9	344	0.4	4,991	1.1	2,965	2.1	206,450	9.0
Inspection	488	0.3	813	4.6	15	0.7	2,656	6.3	45,995	7.2	5,428	3.5	12,136	6.3	4,550	1.2	407	0.4	2,572	0.5	7,578	5.4	82,437	3.6
Vehicle Operation	693	0.4	1,077	6.1	22	1.0	2,330	5.5	24,563	3.9	3,948	2.9	48,334	24.9	25,085	6.8	97	0.1	4,532	1.0	4,421	3.1	117,123	5.1
Farm	158,779	94.6	41	0.2	0	-	1	-	293	-	2	-	24	-	433	0.1	1	-	380	0.1	539	0.2	160,294	7.7
Sales - Knowledge Required	66	-	36	0.2	0	-	170	0.4	20,423	3.2	433	0.3	2,596	1.3	13,439	3.7	18,935	19.4	1,623	0.3	693	0.5	58,416	2.5
Sales - Knowledge Not Required	321	0.2	15	0.1	0	-	73	0.2	23,475	3.7	739	0.5	1,055	0.5	93,880	25.5	152	0.2	3,859	0.8	91	0.1	123,580	5.4
Clerical	606	0.4	440	2.7	22	1.0	2,081	4.9	87,792	12.9	6,779	4.2	53,474	27.6	62,478	16.9	55,580	56.9	57,336	12.3	48,167	34.3	368,876	16.1
Personal Service	4,388	2.6	817	4.6	2	0.1	236	0.6	3,485	0.6	356	0.2	3,291	1.7	4,973	1.4	1,727	1.8	135,657	29.2	5,271	3.8	160,402	7.0
For Customer	26	-	0	-	0	-	2	-	1,809	0.3	3	-	636	0.3	360	0.1	24	-	9,087	2.0	315	0.2	12,261	0.5
Protection	75	-	239	1.4	11	0.5	340	0.8	4,491	0.7	488	0.3	1,662	0.9	798	0.2	281	0.3	3,510	0.8	18,567	13.2	26,422	1.1
Education and Training	0	-	0	-	0	-	0	-	95	-	0	-	55	-	68	-	15	-	59,908	12.9	740	0.5	60,883	2.7
Health	580	0.3	3	-	1	0.1	131	0.3	1,614	0.2	22	-	188	0.1	2,898	0.8	124	0.1	76,565	16.5	2,275	1.6	84,401	3.7
Welfare	2	-	0	-	0	-	0	-	24	-	0	-	0	-	0	-	0	-	12,134	2.6	1,277	0.9	13,437	0.6
Administration and Organization	747	0.5	1,082	6.5	129	6.1	1,122	2.6	43,296	6.8	15,611	10.2	12,063	6.2	75,106	20.4	15,452	15.8	35,232	8.2	15,789	11.2	219,330	9.6
Research and Design	121	0.1	684	3.8	29	1.4	1,379	3.3	18,043	2.8	1,508	1.0	4,210	2.2	1,752	0.5	774	0.8	7,510	1.6	7,460	5.5	43,449	1.9

Community, business and personal service industries with 20.3 per cent of the total labour force was the second most important industry group. With the exception of the trade group, which had 16.1 per cent of the labour force, each of the other industry groups accounted for less than ten per cent of the Ontario labour force which in 1961 totalled 2,286,900 persons.

An examination of the individual job family totals reveals that in Ontario the single most important job family was the tools - non-specialized group. This category accounted for 17.2 per cent of the labour force. The clerical job family was a slightly lower proportion - 16.1 per cent. The other job families, taken individually, accounted for less than ten per cent of the labour force. Some job families contain only a very small fraction of the labour force. For example, the entertainment, protection, welfare, research and design job families taken together accounted for slightly more than four per cent of the labour force.

Tables 2 and 3 present the job.family/industry matrix in the same manner as Table 1 except that Table 2 presents the breakdown for the 1,611,000 males in the Ontario labour force. Table 3 distributes the 676,000 female members of the Ontario labour force.

In terms of the male-female distribution of the labour force, the patterns tend to differ according to the industry group. While manufacturing accounts for the largest proportion of the male labour

Table 7

CANADIAN LABOUR FORCE, MALES, BY INDUSTRY, AND INDUSTRY BY SEX, FAMILIES, 1961

Ind. Family	Agriculture		Forestry		Fishing and Trapping		Mining, Quarries, and Oil Wells		Manufacturing		Construction		Transportation, Communication, and Other Utilities		Trade		Finance, Insurance, and Real Estate		Community, Business, and Personal Service		Public Administration		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Labour Force	164,261	100	17,059	10.0	2,533	1.5	61,203	3.6	500,867	31.1	168,476	9.2	164,323	10.2	246,276	15.4	50,798	3.1	191,224	11.9	102,870	6.4	1,611,310	100
Tools - Specialized	90	0.1	8,877	52.1	24	0.9	599	1.4	27,063	5.4	16,797	11.3	13,668	8.3	3,483	1.4	116	0.2	5,197	2.7	2,033	2.0	77,912	4.8
Tools - Non-specialized	729	0.4	2,048	12.0	104	5.2	7,162	17.4	137,984	27.6	86,391	58.2	33,647	20.5	57,633	23.1	2,464	4.9	22,877	12.0	19,226	18.7	370,097	22.9
Machines - Specialized	25	0.0	346	2.0	1,312	64.6	21,831	33.0	11,915	2.4	7,109	4.8	3,294	2.0	991	0.4	31	0.1	1,661	0.9	2,073	2.0	50,589	3.2
Machines - Non-specialized	151	0.1	278	1.6	372	18.3	2,008	4.9	116,754	23.3	5,488	3.7	2,892	1.8	10,866	4.4	364	0.7	4,657	2.4	2,895	2.8	146,676	9.1
Inspection	266	0.2	408	2.4	5	0.2	2,632	6.4	41,364	8.3	5,418	3.7	11,865	7.2	4,069	1.7	385	0.8	2,042	1.1	7,135	6.9	75,000	4.7
Vehicle Operation	665	0.4	1,075	6.3	22	1.1	2,330	5.7	24,653	4.9	5,939	4.0	48,126	29.3	24,794	10.0	71	0.1	4,302	2.3	4,381	4.3	116,176	7.2
Farm	138,486	84.3	17	0.2	0	0.0	1	0.0	235	0.1	2	0.0	24	0.0	338	0.1	1	0.0	368	0.2	336	0.3	137,769	8.5
Sales - Knowledge Required	51	0.0	3	0.2	0	0.0	169	0.4	19,048	3.8	419	0.3	2,510	1.5	11,517	4.6	17,354	34.2	1,204	0.6	633	0.6	52,971	3.3
Sales - Knowledge Not Required	217	0.1	1	0.1	0	0.0	65	0.2	19,610	3.9	668	0.4	922	0.6	44,663	18.0	103	0.2	1,599	0.8	60	0.0	67,900	4.2
Clerical	120	0.1	0	0.0	0	0.0	1,289	3.1	35,103	7.0	2,657	1.8	28,104	17.1	17,695	7.1	13,362	26.7	13,225	6.9	17,934	17.4	130,182	8.1
Personal Service	4,008	2.4	0	0.0	0	0.0	170	0.4	2,837	0.6	263	0.2	2,307	1.4	1,208	0.5	831	1.6	36,673	20.2	4,158	4.1	54,133	3.4
Entertainment	24	0.0	0	0.0	0	0.0	2	0.0	1,492	0.3	2	0.0	429	0.3	269	0.1	19	0.0	5,339	2.8	248	0.3	7,804	0.5
Protection	76	0.0	14	0.1	1	0.0	339	0.8	4,652	0.9	485	0.3	1,645	1.0	699	0.3	263	0.5	3,321	1.7	18,073	17.5	29,547	1.8
Education and Training	1	0.0	0	0.0	0	0.0	0	0.0	76	0.0	0	0.0	46	0.0	37	0.0	13	0.0	21,875	11.4	457	0.5	22,505	1.4
Health	547	0.3	2	0.0	1	0.1	116	0.3	718	0.1	2	0.0	63	0.0	2,503	1.0	48	0.1	20,066	10.5	967	0.9	25,033	1.6
Welfare	2	0.0	0	0.0	0	0.0	0	0.0	18	0.0	0	0.0	0	0.0	0	0.0	0	0.0	8,124	4.3	818	0.8	8,942	0.6
Administration and Organization	186	0.1	1	0.0	127	5.0	1,101	2.7	40,837	8.1	15,334	10.3	10,767	6.5	66,120	26.6	14,504	28.6	29,973	15.7	14,406	14.0	195,507	12.1
Research and Design	116	0.1	0	0.0	29	1.1	1,370	3.3	17,689	3.5	1,501	1.0	4,052	2.5	1,601	0.7	672	1.3	6,720	3.5	7,057	6.9	41,447	2.6

TABLE 3

ONTARIO LABOUR FORCE, FIDULTS, BY INDUSTRY, AND INDUSTRY BY JOB FAMILY, 1965

Job Family	Industry		Agriculture		Forestry		Fishing and Trapping		Miner, Quarry, and Oil Wells		Manufacturing		Construction		Transportation, Communication, and Other Utilities		Trade		Finance, Insurance, and Real Estate		Community, Business, and Personal Services		Public Administration		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Labour Force	23,944	3.5	627	0.1	75	-	991	0.1	137,738	20.4	4,518	0.7	29,526	4.4	119,940	17.8	46,868	6.9	273,608	40.5	37,780	5.6	675,603	100.0		
Tools - Specialized	11	-	7	1.1	0	-	1	0.1	7,086	5.1	9	0.2	41	0.1	2,714	2.2	23	-	10,758	3.9	139	0.4	20,790	-		
Tools - Non-specialized	101	0.4	106	17.0	43	57.3	33	3.2	9,852	7.1	231	5.1	429	1.5	3,480	2.9	1,100	2.4	6,204	2.3	944	2.5	22,522	3.3		
Machines - Specialized	0	-	4	0.6	12	16.0	6	0.6	2,027	1.5	0	-	24	0.1	105	0.1	1	-	215	0.1	37	0.1	2,431	-		
Machines - Non-specialized	191	0.8	4	0.6	3	4.0	14	1.4	55,725	40.3	52	1.2	160	0.5	3,643	2.9	0	-	335	0.1	70	0.2	59,976	8.9		
Inspection	222	0.9	4	0.6	0	-	24	2.5	4,631	3.4	9	0.2	271	0.9	481	0.4	22	-	530	0.2	444	1.2	6,408	-		
Vehicle Operation	8	-	2	0.3	0	-	0	-	111	0.1	9	0.2	228	0.8	291	0.2	26	0.1	230	0.1	41	0.1	946	0.1		
Farm	22,373	93.4	5	0.8	0	-	0	-	38	-	0	-	-	-	96	0.1	0	-	12	-	1	-	22,325	3.3		
Sales - Knowledge	15	0.1	0	-	0	-	1	0.1	1,355	1.0	14	0.3	86	0.3	2,112	1.8	1,581	3.4	421	0.2	60	0.2	5,445	0.8		
Sales - Knowledge Not Required	114	0.5	2	0.3	0	-	8	0.8	3,865	2.8	71	1.6	133	0.5	49,137	41.0	49	0.1	2,260	0.8	51	0.1	55,690	8.2		
Clerical	486	2.0	176	28.1	13	17.3	792	79.9	47,189	34.3	3,722	82.4	75,370	85.9	44,583	37.2	42,017	89.7	44,111	16.1	30,234	80.0	238,694	35.3		
Personal Service	320	1.4	299	47.7	2	2.7	66	6.7	1,648	1.2	93	2.1	984	3.3	3,764	3.1	896	1.9	96,984	35.4	1,112	2.9	106,169	15.7		
Entertainment	2	-	0	-	0	-	0	-	317	0.2	1	-	208	0.7	131	0.1	6	-	3,748	1.4	67	0.2	4,458	0.7		
Protection	1	-	4	0.6	0	-	1	0.1	39	-	2	-	17	0.1	59	0.1	18	-	189	0.1	544	1.4	875	0.1		
Education and Training	0	-	0	-	0	-	0	-	19	-	0	-	9	-	32	-	2	-	38,033	13.9	283	0.7	38,378	5.7		
Health	33	0.2	1	0.2	0	-	15	1.5	896	0.6	29	0.4	125	0.4	395	0.3	76	0.2	36,499	20.6	1,308	3.5	59,388	8.8		
Welfare	0	-	0	-	0	-	0	-	6	-	0	-	0	-	0	-	0	-	4,010	1.5	459	1.2	4,475	0.7		
Administration and Organization	62	0.3	10	1.6	2	2.7	21	2.2	2,358	1.9	277	6.1	1,317	4.4	8,986	7.5	949	2.0	8,259	3.0	1,383	3.7	23,823	3.5		
Research and Design	5	-	3	0.5	0	-	9	0.9	375	0.3	7	0.2	158	0.5	151	0.1	102	0.2	780	0.3	603	1.6	2,202	0.3		

force in Ontario - 31.1 per cent or some 501,000 persons - females had their highest proportion - 40.5 percent or about 274,000 persons - in the community, business and personal service industries.

Females tended to be more concentrated in selected industries than males. In 1961 the three largest groups, community, business and personal service industries, manufacturing and trade accounted for 78.7 per cent of the female labour force. In the case of males, the three most important industries, manufacturing, trade, community, business and personal service industries accounted for a significantly smaller proportion of the labour force - 58.4 per cent.

Marked differences in the sex distribution of job families are also evident from the data. While men were concentrated in the tools - non-specialized, administration and organization, and machines - non-specialized job families, the female labour force was concentrated in the clerical, personal service, and machines - non-specialized job families.

As was the case in the industrial distribution of the labour force, females were less evenly distributed than males by job family. The three most important male job families referred to above accounted for 44.1 per cent of the labour force while the three most important female job families contained 59.9 per cent.

The data in Table 2 for the male labour force, when considered in terms of each of the three most important industries, shows that for

manufacturing, the tools - non-specialized job family accounted for 27.6 per cent of all job families in that industry. With respect to trade, the administrative and organization job family accounted for just over one-quarter of the labour force within the industry. In terms of product knowledge requirements, it is interesting to note that a significantly smaller proportion - less than five per cent - of those in trade industries are classified as being in the sales - considerable knowledge required category. In the community, business and personal service industry group, the personal service job family was the most important in terms of size.

Analysis of female job families by industry indicates that in the largest industry - community, business, and personal service - more than one-third of the female labour force in that industry, or about 97,000 persons, were in the personal service job family. In the manufacturing industries, slightly more than two-fifths of the labour force was in the machines - non-specialized job family. The sales - little knowledge required job family was the most prevalent family for females in the trade industry groups.

Charts 3, 4 and 5 rank total, male, and female Ontario labour force first by job families, and then from left to right, in descending order of job family size by the industry distribution of the job family.

While reference has already been made to the dominant job

CHART 3



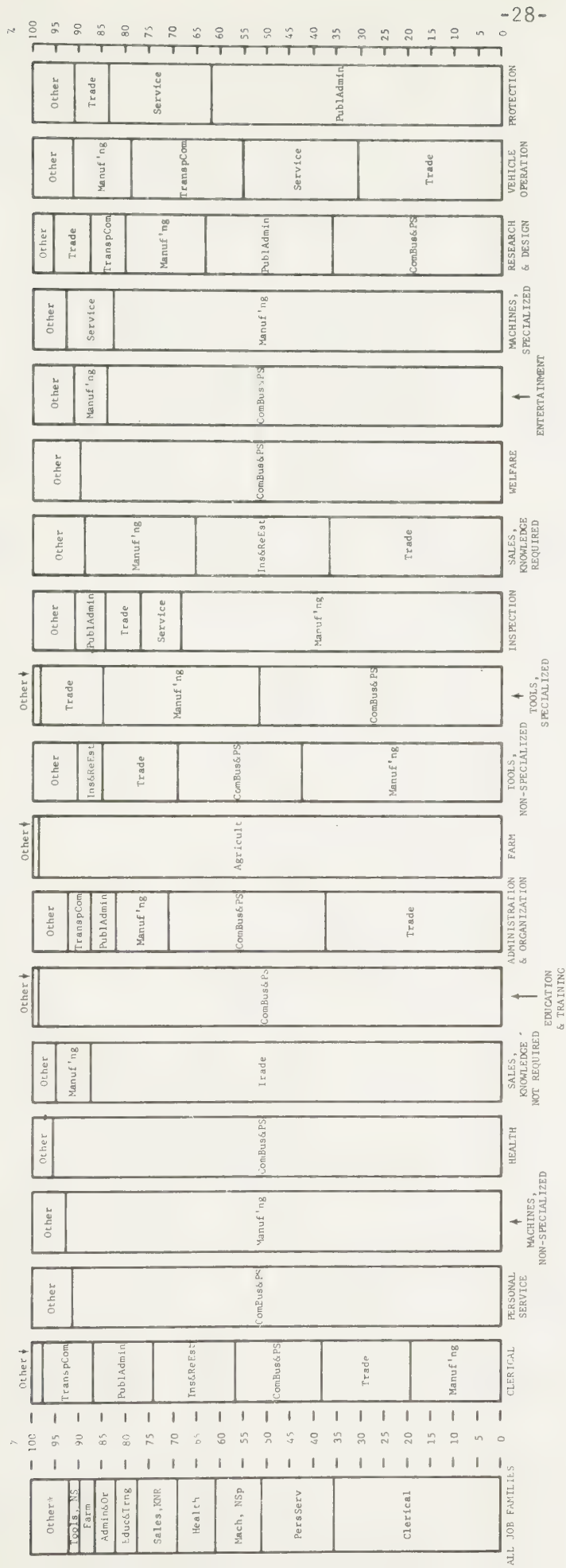
*"Other" includes the following job families:

- Admin/Insr = Administration & Organization
- Ag = Agriculture
- CombusKPS = Community, Business & Personal Service
- Const = Construction
- EduCnTrng = Education & Training
- Inspct'n = Inspection
- InsdEst = Insurance & Real Estate
- Mach, Nsp = Machines, Non-Specialized
- Manuf'g = Manufacturing
- MinQuarOW = Mines, Quarries & Oil Wells
- PerSrv = Personal Service
- PublAdmin = Public Administration
- Sales,KNW = Sales, Knowledge Not Required
- Tools, Np = Tools, Non-Specialized
- Tools, Sp = Tools, Specialized
- TranspCom = Transportation, Communication, etc.
- VeHicOper = Vehicle Operation



- Adminfor = Administration & Organization
- AgriCult = Agriculture
- ComBus = Community, Business & Personal Service
- Const = Construction
- InspeCt = Inspection
- Insur = Insurance & Real Estate
- Mach, Sp = Machines, Non-Specialized
- Mach, Sp = Machines, Specialized
- Manuf = Manufacturing
- Mining = Mining
- MinQuar = Mines Quarries & Oil Wells
- PerSrv = Personal Service
- PubAdmin = Public Administration
- Sales KNR = Sales, Knowledge Not Required
- Sales, KNR = Sales, Knowledge Required
- Tools, NS = Tools, Non-Specialized
- Tools, Sp = Tools, Specialized
- TranspCom = Transportation, Communication, etc.
- VehicleOper = Vehicle Operation

CHART 5
PERCENTAGE DISTRIBUTION OF ONTARIO LABOUR FORCE JOB FAMILIES, FEMALES, 1961



*"Other" includes the following job families:
 Tools, Specialized..... 3.1
 Inspection..... 1.0
 Sales, Knowledge Required..... 0.8
 Welfare..... 0.7
 Entertainment..... 0.6
 Machines, Specialized..... 0.4
 Research & Design..... 0.3
 Vehicle Operation & Protection..... 0.1

AdminsOr = Administration & Organization
 Agricult = Agriculture
 ComBus&PS = Community, Business & Personal Service
 Educ&Trng = Education & Training
 Ins&ReEst = Insurance & Real Estate
 Mach, NSP = Machines, Non-Specialized
 Manuf'ng = Manufacturing
 PersServ = Personal Service
 PublAdmin = Public Administration
 Sales, KOR = Sales, Knowledge Not Required
 Tools, NS = Tools, Non-Specialized
 TranspCom = Transportation, Communication, etc.

families, the footnote to Chart 3 shows that there are a number of relatively small job families. In this "other" group of job families each individual job family accounts for less than three per cent of the total, or fewer than 59,000 persons in any one job family in this category. The welfare and entertainment groups were the least significant in terms of size. Both taken together account for just over one per cent of the total labour force.

If only those job families which taken together constitute more than 50 per cent of the labour force are considered (tools - non-specialized, clerical, administration and organization, and machines - non-specialized), it is clear that manufacturing, which accounts for about 639,000 persons in all, is the largest sector of employment of three of the four most important job families. Within these same four job families, trade appears as the most important industry for the administration and organization job family and ranks second in two of the three other job families.

Charts 4 and 5 show the male and female distribution of the labour force by job family and industry. In the case of males, four job families, as was true for the total labour force, account for slightly more than one-half of the total male labour force. The four job families are not, however, the same as was the case for the total labour force. Tools - non-specialized remained the single most important job family since this job family is dominated by males and clerical in the total labour force was displaced by administration and

organization. Machines - non-specialized ranked third, while the farm occupations ranked fourth in order of importance.

The female distribution of the labour force by job families reveals a marked difference from that of males in the relative importance of certain job families. The single most important job family was clerical. Just over 35 per cent of all females in the labour force or about 239,000 persons were in this category. When combined with the personal service job family, which was next in importance, these two job families totalled some 345,000 persons and accounted for slightly more than 50 per cent of the total female labour force.

Other than the machines - non-specialized job family, the four most important female job families are quite different from the male. Another difference is that the female labour force tends to be concentrated in fewer job families. Two job families account for slightly more than 50 per cent of the female labour force; for males, four job families must be considered before one-half of the labour force has been allocated by job family. Put another way, for females, nine job families must be considered to attain a 90 per cent distribution of the total. In the case of males, twelve families need to be considered in order to attain the same level of aggregation.

5. Projected Changes in Job Families, 1971-1991

Thus far, the analysis has concentrated on the changes which have occurred in job families during the two decades 1941-1961. Recognizing that there are only three observations on which to base a

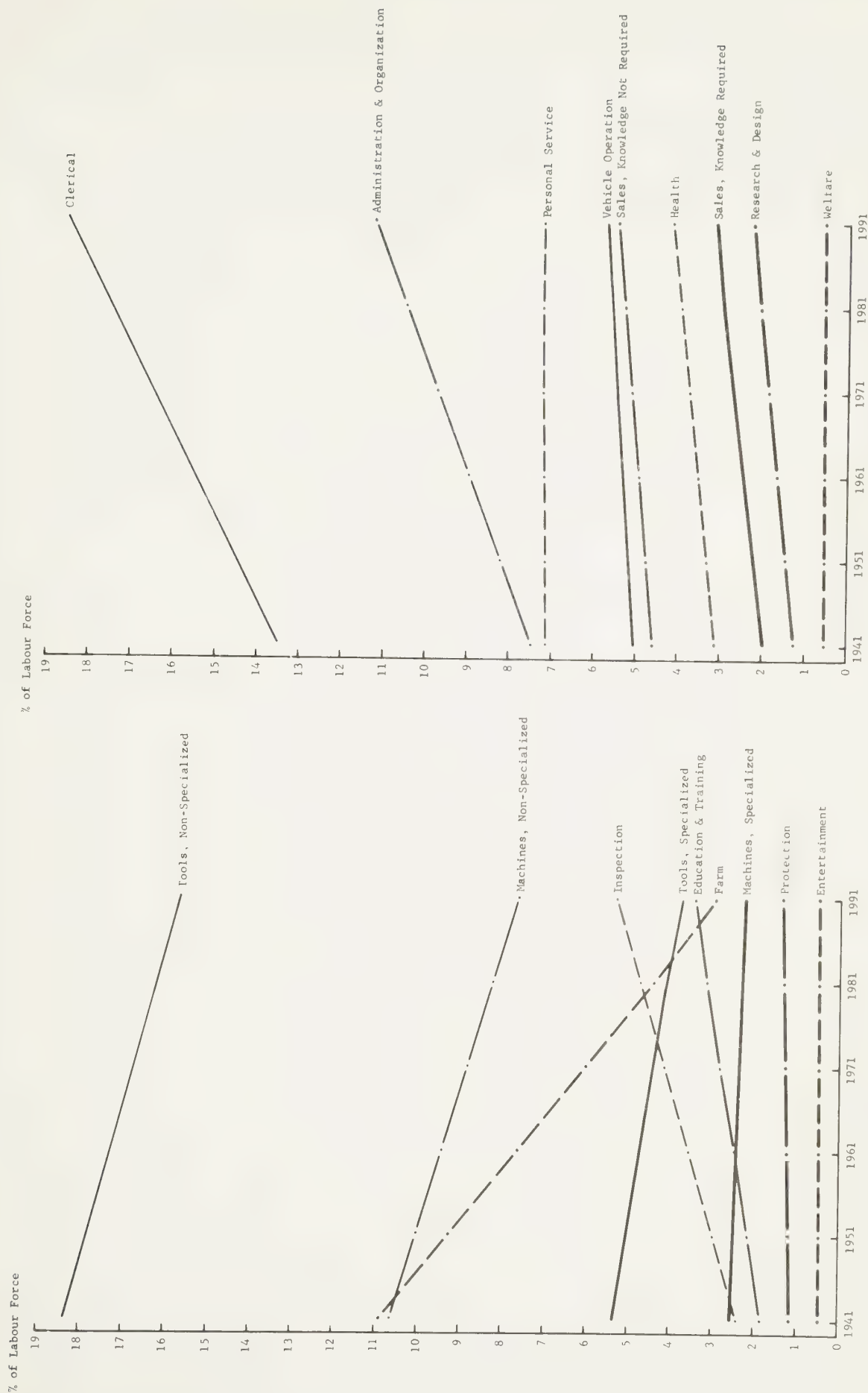
projection, it was still felt that some attempt should be made to assess the probable future distribution of the labour force by job families.

The procedure used to project the changes in job families was to plot the proportion that each male and female job family was to the respective male and female labour force totals for each of the three base years.⁽¹⁾ A trend line was then fitted to these points and projections of proportions were made for each job family for 1971, 1981, and 1991. The trend lines were subsequently adjusted to ensure that the total of the proportions of all job families did not exceed 100 per cent.

The trend line projections to 1991 of the Ontario job families are shown in Chart 6. Projections of job families for males and females are found in Charts 7 and 8, respectively. It is evident from Chart 6 that marked changes are anticipated in all but a few job families. Despite the qualifications which have already been made concerning the inadequate time series, it seems evident that in terms of numbers the clerical job family will rank as the single most important job family. Although tools - non-specialized is expected to remain second in importance, it will continue to decline as a proportion of the total labour force. The administration

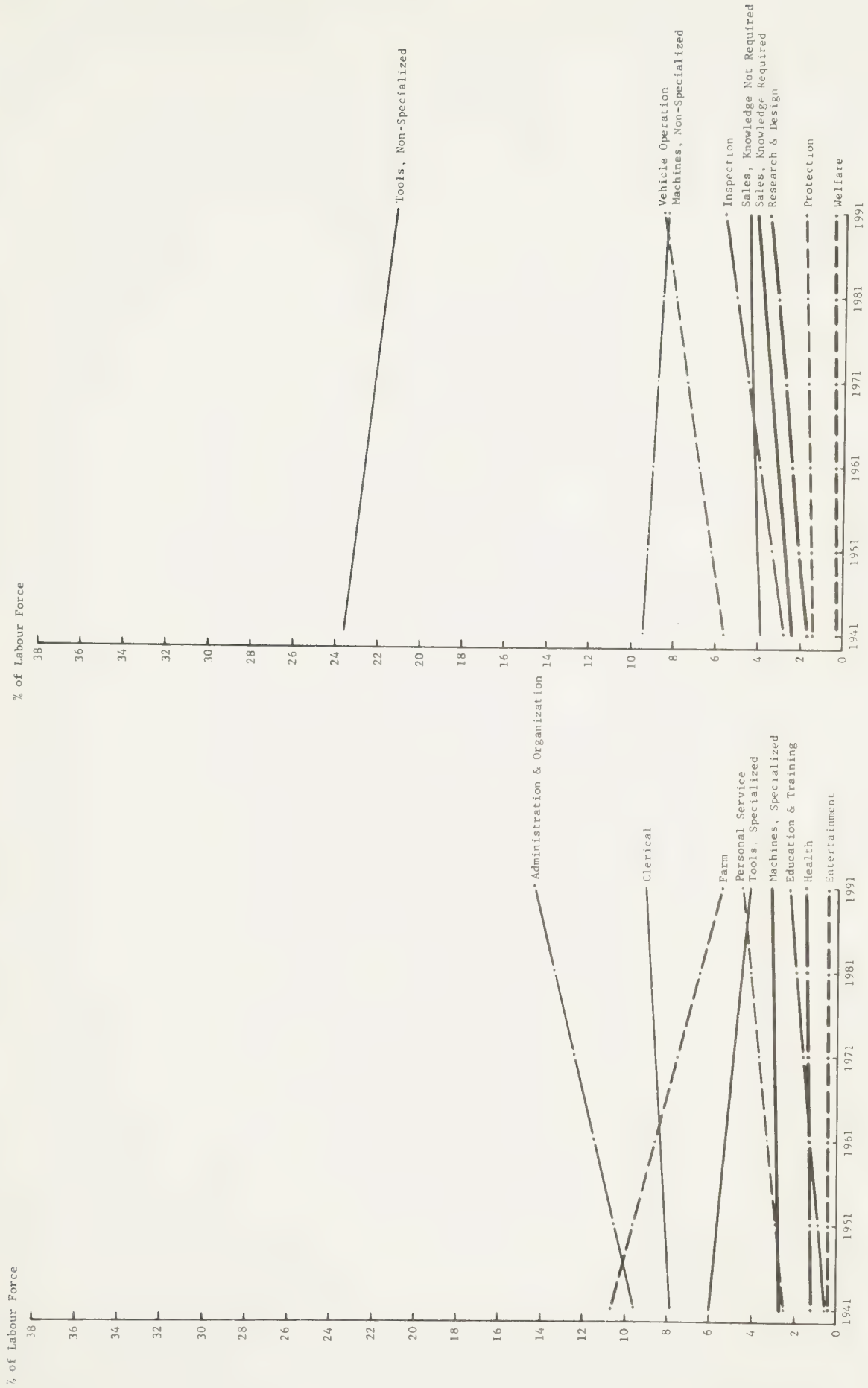
(1) The Canadian male-female job family ratios were applied to Ontario job family totals.

CHART 6
TREND LINE PROJECTIONS TO 1991 OF TOTAL ONTARIO JOB FAMILIES



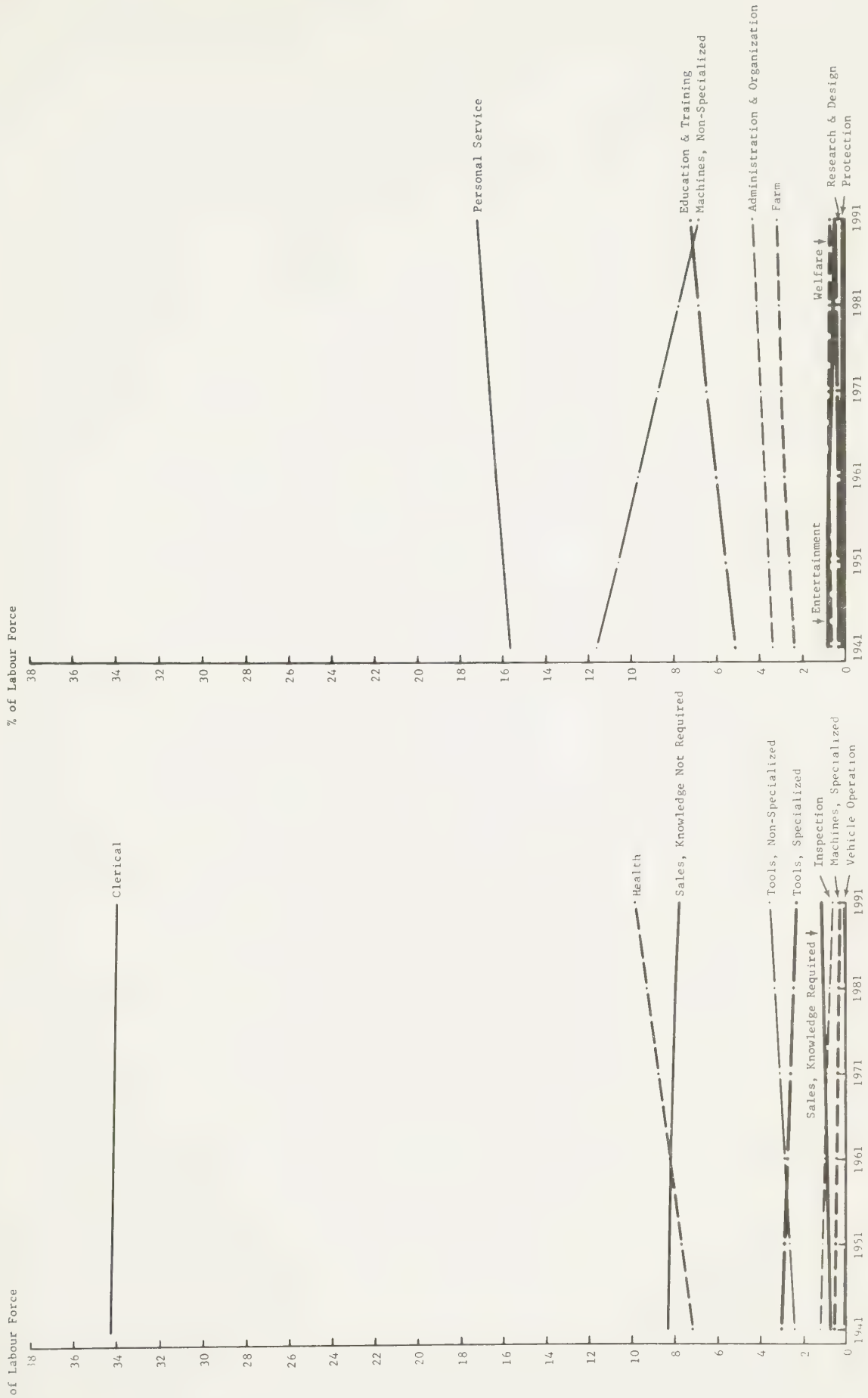
Source: Data for 1941, 1951 and 1961 derived from J.G. Scoville, The Job Content of the Canadian Economy, 1941, 1951 and 1961, DBS, Special Labour Force Studies No. 3.

CHART 7
TREND LINE PROJECTIONS TO 1991 OF ONTARIO JOB FAMILIES, MALES



Source: See Chart 6.

CHART 8
TREND LINE PROJECTIONS TO 1991 OF ONTARIO JOB FAMILIES, FEMALES



Source: See Chart 6.

and organization job family is expected to increase its share of the total labour force. Towards the end of the projection period this job family will rise to the third rank in order of importance.

Chart 6 indicates that a number of job families will become proportionately less important in the future. Included in this group and ranked by size at the end of the projection period are: tools - non-specialized; machines and equipment - non-specialized; tools - specialized; farm; and machines and equipment - specialized. The entertainment, protection, personal service, and welfare job families do not exhibit any significant changes in their respective proportions of the labour force. The other job families shown in Chart 6 but not already referred to are expected to grow as a proportion of the labour force. Even though their proportion may almost double in some instances, in terms of numbers, any one of these job families will not form a significant proportion of the labour force.

Charts 7 and 8 show the projected proportions of the male and female labour force in each of the 18 job families. A comparison of these two charts with the total for both males and females illustrates the extent to which job families in Chart 6 are "pulled" by the male-female weighting in a particular job family. For example, the males in the clerical job family account for less than ten per cent of male labour force, yet because the proportion of female labour force is so great - some 34 per cent at the end of the

projection period - this family is shown to be the most important in the total labour force after 1971.

The final step in determining the probable future numbers of persons in each of the job families was to apply the individual male and female trend line projections of job family proportions to the "Most Probable" labour force projection.⁽¹⁾ The results of this computation are shown in Table 4.

6. Educational Achievement of the Ontario Labour Force

The methodology used to determine educational achievement levels was outlined in section 2. It bears repeating here that any conclusions drawn from the data presented should be tempered by the assumptions made. In essence, the 1961 census figures have been adjusted in such a manner so as to present a moving picture from a single snapshot. It is seen in Table 5 below that Canadian educational achievement levels have been moving higher, although marked differences remain in attainment levels as between males and females.

(1) Ontario Labour Force Projections, 1968-1991, Economic Planning Branch, Policy Planning Division, Department of Treasury and Economics, October, 1968.

TABLE 4

ONTARIO LABOUR FORCE BY SEX, 1961, 1951, 1961 AND
PROJECTED 1971, 1981, AND 1991

by Family	1961			1951			1961		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
Tools - Specialized	68,700	8,200	76,900	80,700	13,500	94,200	87,100	18,300	105,400
Tools - Non-specialized	250,500	5,900	256,400	262,600	11,300	273,900	271,100	19,100	290,200
Machines - Specialized	41,100	2,400	43,500	38,400	2,900	41,300	33,600	2,000	35,600
Machines - Non-specialized	101,700	44,400	146,100	135,900	61,100	197,000	142,600	64,100	206,700
Inspection	28,100	3,700	31,800	51,700	5,500	57,200	77,300	6,000	83,300
Vehicle Operation	50,400	100	50,500	100	11,600	11,700	116,800	900	117,700
Farm	245,400	4,900	250,300	188,800	7,700	196,500	161,100	19,600	180,700
Sales - Knowledge Required	2,400	1,200	3,600	39,600	5,000	44,600	53,700	5,200	58,900
Sales - Knowledge Not Required	44,700	24,600	69,300	52,000	36,300	88,300	71,000	35,300	106,300
Clerical	87,200	73,600	160,800	115,800	169,100	284,900	163,900	226,900	390,800
Personal Service	25,700	89,100	114,800	33,500	66,600	100,100	54,000	107,100	161,100
Entertainment	3,800	2,400	6,200	4,900	3,000	7,900	7,600	4,800	12,400
Protection	16,400	200	16,600	20,600	300	20,900	29,500	700	30,200
Education and Training	7,400	18,600	26,000	19,400	22,100	41,500	40,100	61,200	101,300
Health	11,100	19,700	30,800	18,000	30,000	48,000	25,200	39,700	64,900
Welfare	4,600	2,800	7,400	5,200	3,900	9,100	8,900	4,700	13,600
Administration and Organization	84,000	7,100	91,100	148,500	15,400	163,900	194,400	23,800	218,200
Research and Design	13,700	800	14,500	24,800	1,500	26,300	41,700	2,400	44,100
Total	1,138,900	310,500	1,449,400	1,404,300	433,600	1,837,900	1,639,000	660,000	2,299,000

	1971			1981			1991		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
Tools - Specialized	99,400	25,500	124,900	110,700	30,800	141,500	137,900	36,400	174,300
Tools - Non-specialized	449,200	30,500	479,700	528,700	40,600	569,300	595,300	48,700	644,000
Machines - Specialized	50,300	3,000	53,300	71,300	3,700	75,000	81,400	4,000	85,400
Machines - Non-specialized	176,800	83,600	260,400	209,600	94,700	304,300	227,500	109,100	336,600
Inspection	105,200	8,900	114,100	137,700	9,800	147,500	185,700	11,500	197,200
Vehicle Operation	150,400	1,000	151,400	391,800	1,200	393,000	229,400	1,400	230,800
Farm	146,400	29,500	175,900	167,500	38,100	205,600	160,400	44,400	204,800
Sales - Knowledge Required	21,200	9,800	31,000	82,500	13,500	96,000	112,500	17,200	129,700
Sales - Knowledge Not Required	87,400	79,700	167,100	105,800	98,400	204,200	123,400	114,600	238,000
Clerical	185,000	237,400	422,400	218,700	419,500	638,200	264,000	488,400	752,400
Personal Service	67,000	162,200	229,200	91,000	205,400	296,400	109,300	261,000	370,300
Entertainment	10,200	5,900	16,100	12,300	7,400	19,700	14,000	8,600	22,600
Protection	38,400	1,000	39,400	46,500	1,200	47,700	53,400	1,600	55,000
Education and Training	32,500	63,800	96,300	64,300	82,400	146,700	59,200	98,800	158,000
Health	32,500	92,300	124,800	39,300	118,100	157,400	67,700	140,500	208,200
Welfare	10,200	6,800	17,000	12,300	8,600	20,900	16,000	8,500	24,500
Administration and Organization	232,100	39,300	271,400	316,800	50,400	367,200	367,900	60,200	428,100
Research and Design	58,900	3,900	62,800	76,200	6,100	82,300	92,700	6,500	99,200
Total	2,032,600	983,700	3,016,300	3,459,200	1,230,000	4,689,200	2,808,100	1,432,800	4,240,900

Source: 1961, 1951, and 1991 derived from J. C. Scoville, *The Job Content of the Canadian Economy, 1961, 1951 and 1991*
 Total of labour force projections from *Ontario Labour Force Projections, 1968-1991*, Economic Planning Branch,
 Policy Planning Division, Dept. of Treasury and Economics, October 1968

TABLE 5

EDUCATIONAL ATTAINMENT OF THE CANADIAN LABOUR FORCE
14 YEARS OF AGE AND OVER, 1960 AND 1965

	Males		Females		Total	
	1960	1965	1960	1965	1960	1965
	Per cent					
Less than a Complete High School Education	78.8	75.1	65.1	62.4	75.3	71.4
Completed High School Education or Attended University	21.2	24.9	35.0	37.5	24.7	28.6
University Degree	4.8	5.7	3.6	4.6	4.5	5.4

Source: DBS, Special Labour Force Study No.1, Educational Attainment of the Canadian Population and Labour Force, 1960-65 by F.J. Whittingham, p.21. Data shown is based on a February survey.

The table shows that, with the exception of those having a university degree, females in the labour force were better educated both in 1960 and 1965. Over the five-year period, the gap, expressed in terms of percentage points, has narrowed for all three attainment levels.

The computed achievement of the Canadian and Ontario labour force is summarized in Table 6. While Canadian educational achievement levels have been applied to Ontario data, the figures are not identical because of differing proportions of the labour force in various job families. For males, the educational achievement levels in the labour force are higher in Ontario than for the Canadian labour force. For females, the picture is not so clear since females in the Ontario labour force had a larger proportion in the secondary

TABLE 6

EDUCATIONAL ACHIEVEMENT OF THE CANADIAN AND ONTARIO LABOUR FORCE, 1961

	<u>Canada</u>	Per Cent	<u>Ontario</u>
Males			
Elementary	40.5		38.2
Secondary	49.3		50.9
University	10.2		10.9
Females			
Elementary	28.4		27.3
Secondary	63.1		64.9
University	8.5		7.8
Total			
Elementary	37.1		35.0
Secondary	53.2		55.0
University	9.7		10.0

achievement group. At the same time, the proportion of Ontario females having attended university was lower than for all Canada.

Comparison of total figures for males and females shows that the educational achievement of the Ontario labour force was higher than that of Canada. The data in Table 6 confirms the conclusions of Table 5 in that, except at the university level, females in the labour force had a higher educational achievement.

The extent to which educational achievement levels vary by industry is presented in Table 7. The data shows that educational achievement at the university level shows marked industry contrasts. For example, in agriculture 2.2 per cent of the labour force were in the university category, while in the community, business and personal service industry almost 20 per cent were in the same category. Except for agriculture, forestry, fishing and trapping, mines, quarries and oil wells, and construction, each of the other industries had less than 50 per cent of the labour force possessing an elementary educational achievement.

The highest proportion of the labour force with a secondary educational achievement was found in the finance, insurance, and real estate industry group at 76.2 per cent. This industry group also had the smallest proportion in the elementary educational achievement group.

The elementary educational achievement column provides a good indication of the degree of general level training and skill requirements by industry. There is a high degree of correlation between low educational achievement and primary industries. Almost 70 per cent of those in fishing and trapping have an elementary educational achievement level. Admittedly, the numbers involved are small - fewer than 1,500 persons - but the conclusion can be

TABLE 7

EDUCATIONAL ACHIEVEMENT OF THE ONTARIO LABOUR FORCE, BY INDUSTRY, 1961

<u>Industry</u>	<u>Elementary</u>	<u>Secondary</u>	<u>University</u>	<u>Total</u>	<u>%</u>	<u>Percentage Distribution</u>		
						<u>Elementary</u>	<u>Secondary</u>	<u>University</u>
Agriculture	97,929	66,513	3,764	168,205	7.4	58.2	39.6	2.2
Forestry	11,143	5,762	761	17,666	0.7	63.1	32.6	4.3
Fishing and Trapping	1,472	566	70	2,108	0.1	69.9	26.8	3.3
Mines, Quarries, and Oil Wells	19,096	20,402	2,696	42,194	1.8	45.3	48.3	6.4
Manufacturing	242,708	349,685	46,191	638,584	27.9	38.0	54.8	7.2
Construction	79,397	68,127	5,470	152,994	6.7	51.9	44.5	3.6
Transportation, Communication, and Other Utilities	64,462	116,737	12,660	193,859	8.5	33.3	60.2	6.5
Trade	109,824	226,044	32,348	368,216	16.1	29.8	61.4	8.8
Finance, Insurance, and Real Estate	10,321	74,447	12,898	97,666	4.3	10.6	76.2	13.2
Community, Business, and Personal Service	131,311	241,311	92,188	464,810	20.3	28.3	51.9	19.8
Public Administration	32,538	88,678	19,394	140,610	6.2	23.1	63.1	13.8
Total	800,201	1,258,271	228,440	2,286,912	100.0	35.0	55.0	10.0

drawn that in this and other primary industries a significant proportion of the labour force is just at or even below the level of functional literacy.

Tables 8 and 9 provide a male-female breakdown of the labour force by industry. In the case of males, the community, business and personal service industry moves higher compared to the total labour force - with almost 30 per cent - of the male labour force with a university educational achievement. The elementary category for males accounted for a larger proportion of males than the total labour force because, as has been noted, females tend to have a greater proportion in the secondary educational achievement level than males. A comparison of Tables 8 and 9 shows that in each industry, with the exception of construction, there is a higher proportion of males than females in the university achievement level column.

The educational achievement of the Ontario labour force by job family is summarized in Table 10. This breakdown reveals that there is a much greater spread of educational achievement levels as between job families than was noted in the industrial breakdown. At the university achievement level, for example, the vehicle operation job family with 1.3 per cent of the labour force sharply contrasts with the welfare job family in which 64.2 per cent have a university educational achievement level. While the

TABLE 8

EDUCATIONAL ACHIEVEMENT OF THE ONTARIO LABOUR FORCE, BY INDUSTRY, MALES, 1961

Industry	Elementary	Secondary	University	Total	%	Percentage Distribution		
						Elementary	Secondary	University
Agriculture	84,794	56,061	3,406	144,260	9.0	58.8	38.8	2.4
Forestry	10,875	5,421	743	17,039	1.0	63.8	31.8	4.4
Fishing and Trapping	1,434	532	67	2,033	0.1	70.5	26.2	3.3
Mines, Quarries, and Oil Wells	18,968	19,600	2,635	41,202	2.6	46.0	47.6	6.4
Manufacturing	189,324	269,416	42,106	500,847	31.1	37.8	53.8	8.4
Construction	78,820	64,422	5,234	148,476	9.2	53.1	43.4	3.5
Transportation, Communication, and Other Utilities	60,797	92,306	11,220	164,323	10.2	37.0	56.2	6.8
Trade	83,309	138,039	26,928	248,276	15.4	33.6	55.6	10.8
Finance, Insurance, and Real Estate	5,347	34,901	10,550	50,798	3.1	10.5	68.7	20.8
Community, Business, and Personal Service	53,663	81,127	56,434	191,224	11.9	28.1	42.4	29.5
Public Administration	28,298	58,301	16,230	102,830	6.4	27.5	56.7	15.8
Total	615,629	820,126	175,553	1,611,308	100.0	38.2	50.9	10.9

TABLE 9

EDUCATIONAL ACHIEVEMENT OF THE ONTARIO LABOUR FORCE, BY INDUSTRY, FEMALES, 1961

<u>Industry</u>	<u>Elementary</u>	<u>Secondary</u>	<u>University</u>	<u>Total</u>	<u>%</u>	<u>Percentage Distribution</u>		
						<u>Elementary</u>	<u>Secondary</u>	<u>University</u>
Agriculture	13,134	10,452	358	23,944	3.5	54.9	43.6	1.5
Forestry	268	340	19	627	0.1	42.8	54.2	3.0
Fishing and Trapping	39	34	2	75	-	52.0	45.3	2.7
Mines, Quarries, and Oil Wells	128	803	61	991	0.1	12.9	81.0	6.1
Manufacturing	53,383	80,269	4,085	137,738	20.4	38.7	58.3	3.0
Construction	578	3,705	236	4,518	0.7	12.8	82.0	5.2
Transportation, Communication, and Other Utilities	3,665	24,430	1,441	29,536	4.4	12.4	82.7	4.9
Trade	26,515	88,005	5,420	119,940	17.7	22.1	73.4	4.5
Finance, Insurance, and Real Estate	4,974	39,546	2,348	46,868	6.9	10.6	84.4	5.0
Community, Business, and Personal Service	77,649	160,183	35,754	273,586	40.5	28.4	58.5	13.1
Public Administration	4,240	30,377	3,163	37,780	5.6	11.2	80.4	8.4
Total	184,572	438,145	52,886	675,603	100.0	27.3	64.9	7.8

educational achievement of this group is indeed high, only 0.6 per cent of the total labour force are in the welfare job family.

Job families in which university educational achievement is attained by more than ten per cent of the labour force include: sales - knowledge required; entertainment; education and training; health; welfare; administration and organization; and research and design.

An examination of the data for the tools, machines, and sales groups reveals some interesting parallel and contrasting developments in terms of educational achievement levels. In both the tools and machines group, over one-half of those in the labour force possessed not more than an elementary educational achievement level. The differences between the four job families in terms of educational achievement are quite small. It should be noted that the educational achievement levels shown are not those of the entire labour force in a particular job family, but rather of those who might be termed to be relatively new entrants - the 25-34 age groups. The two sales job families indicate that sales - considerable knowledge of product required category shows lower secondary educational achievement levels than the sales - considerable knowledge of product not required job family, although at the university level the former accounts for a larger proportion than the latter.

It can be seen from Table 10 that educational achievement levels for large numbers in the labour force are not high. Thus, in

TABLE 10
EDUCATIONAL ACHIEVEMENT OF THE ONTARIO LABOUR FORCE, BY JOB FAMILY, 1961

Job Family	Elementary	Secondary	University	Total	%	Percentage Distribution		
						Elementary	Secondary	University
Tools - Specialized	50,422	46,053	2,226	98,701	4.3	51.1	46.7	2.2
Tools - Non-specialized	210,185	176,722	5,712	392,619	17.2	53.5	45.0	1.5
Machines - Specialized	26,694	24,606	1,720	53,020	2.3	50.4	46.4	3.2
Machines - Non-specialized	110,732	93,211	2,707	206,650	9.0	53.6	45.1	1.3
Inspection	23,300	51,882	7,455	82,637	3.6	28.2	62.8	9.0
Vehicle Operation	61,466	54,173	1,483	117,123	5.1	52.5	46.2	1.3
Farm	94,579	62,920	2,795	160,294	7.0	59.0	39.3	1.7
Sales - Knowledge Required	13,013	39,659	5,944	58,616	2.6	22.2	67.7	10.1
Sales - Knowledge Not Required	26,681	86,909	10,000	123,590	5.5	21.6	70.3	8.1
Clerical	34,586	304,058	30,232	368,876	16.1	9.4	82.4	8.2
Personal Service	86,670	70,825	2,907	160,402	7.0	54.0	44.2	1.8
Entertainment	1,791	7,198	3,272	12,261	0.5	14.6	58.7	26.7
Protection	8,427	20,861	1,134	30,422	1.3	27.7	68.6	3.7
Education and Training	1,153	25,617	34,113	60,883	2.7	1.9	42.1	56.0
Health	11,494	47,929	24,978	84,401	3.7	13.6	56.8	29.6
Welfare	697	4,110	8,630	13,437	0.6	5.2	30.6	64.2
Administration and Organization	36,877	126,956	55,497	219,330	9.6	16.8	57.9	25.3
Research and Design	1,435	14,583	27,631	43,649	1.9	3.3	33.4	63.3
Total	800,201	1,258,271	228,440	2,286,912	100.0	35.0	55.0	10.0

seven of the 18 job families, over one-half of the labour force has an elementary educational achievement. These seven job families accounted for 52 per cent of the Ontario labour force.

We have already drawn attention to the fact that of the males in the labour force, there was a higher proportion of the total with an elementary educational achievement level than was true for females. The extent to which this pattern exists in job families can be seen in Tables 11 and 12. A comparison of the two tables reveals that there are six job families in the male labour force in which 50 per cent or more of the labour force has an elementary educational achievement level. While it is true that there are the same number of female job families with this educational achievement level (in practically the same job families), the females in these job families represented 34.7 per cent of the total female labour force while for males the proportion was 54.3 per cent.

A comparison of male and female university educational achievement levels reveals that in the case of males, four job families - education and training, health, welfare, and research and design - had more than 50 per cent of the labour force at this level. Taken together these four job families represented 98,000 persons or only 6.1 per cent of the male labour force. Only in the research and design job family did more than 50 per cent of the female labour possess a university educational

TABLE 11

EDUCATIONAL ACHIEVEMENT OF THE ONTARIO LABOUR FORCE, BY JOB FAMILY, MALES, 1961

Job Family	Elementary	Secondary	University	Total	%	Percentage Distribution		
						Elementary	Secondary	University
Tools - Specialized	38,074	37,753	2,085	77,912	4.8	48.9	48.4	2.7
Tools - Non-specialized	196,430	168,085	5,582	370,097	22.9	53.1	45.4	1.5
Machines - Specialized	25,275	23,676	1,637	50,589	3.2	50.0	46.8	3.2
Machines - Non-specialized	74,135	70,044	2,494	146,674	9.1	50.5	47.8	1.7
Inspection	20,644	48,415	6,941	76,000	4.7	27.2	63.7	9.1
Vehicle Operation	61,257	53,477	1,442	116,176	7.2	52.7	46.0	1.3
Farm	81,906	53,357	2,506	137,769	8.6	59.5	38.7	1.8
Sales - Knowledge Required	12,313	35,094	5,564	52,971	3.3	23.2	66.3	10.5
Sales - Knowledge Not Required	11,367	48,001	8,532	67,900	4.2	16.7	70.7	12.6
Clerical	15,442	95,938	18,803	130,182	8.1	11.9	73.7	14.4
Personal Service	29,729	22,996	1,508	54,233	3.3	54.8	42.4	2.8
Entertainment	1,428	4,524	1,851	7,804	0.5	18.3	58.0	23.7
Protection	8,210	20,332	1,005	29,547	1.8	27.8	68.8	3.4
Education and Training	467	4,822	17,216	22,505	1.4	2.1	21.4	76.5
Health	4,176	6,713	14,144	25,033	1.6	16.7	26.8	56.5
Welfare	347	2,023	6,592	8,962	0.6	3.9	22.6	73.5
Administration and Organization	33,114	111,254	51,140	195,507	12.1	16.9	56.9	26.2
Research and Design	1,316	13,621	26,511	41,447	2.6	3.2	32.8	64.0
Total	615,629	820,126	175,554	1,611,310	100.0	38.2	50.9	10.9

TABLE 12
EDUCATIONAL ACHIEVEMENT OF THE ONTARIO LABOUR FORCE, BY JOB FAMILY, FEMALES, 1961

Job Family	Elementary	Secondary	University	Total	%	Percentage Distribution		
						Elementary	Secondary	University
Tools - Specialized	12,348	8,300	141	20,790	3.1	59.4	39.9	0.7
Tools - Non-specialized	13,755	8,636	130	22,522	3.3	61.1	38.3	0.6
Machines - Specialized	1,418	929	83	2,431	0.4	58.4	38.2	3.4
Machines - Non-specialized	36,596	23,167	213	59,976	8.9	61.0	38.6	0.4
Inspection	2,656	3,467	515	6,638	1.0	40.0	52.2	7.8
Vehicle Operation	209	696	41	946	0.1	22.1	73.5	4.4
Farm	12,672	9,564	289	22,525	3.3	56.3	42.4	1.3
Sales - Knowledge Required	700	4,565	380	5,645	0.8	12.4	80.9	6.7
Sales - Knowledge Not Required	15,314	38,908	1,468	55,690	8.2	27.5	69.9	2.6
Clerical	19,144	208,120	11,430	238,694	35.3	8.0	87.2	4.8
Personal Service	56,941	47,829	1,399	106,169	15.7	53.6	45.1	1.3
Entertainment	363	2,673	1,421	4,458	0.6	8.1	60.0	31.9
Protection	217	529	129	875	0.1	24.8	60.5	14.7
Education and Training	686	20,795	16,897	38,378	5.8	1.8	54.2	44.0
Health	7,319	41,215	10,834	59,368	8.9	12.3	69.4	18.3
Welfare	350	2,087	2,038	4,475	0.7	7.8	46.6	45.6
Administration and Organization	3,764	15,702	4,357	23,823	3.5	15.8	65.9	18.3
Research and Design	119	962	1,120	2,202	0.3	5.4	43.7	50.9
Total	184,572	438,145	52,886	675,603	100.0	27.3	64.9	7.8

achievement level. Table 12 shows that this female job family accounted for a mere 0.3 per cent of the female labour force.

7. Matrix of Educational Achievement Levels, Industry by Job Family

In the process of reclassifying the Census occupational data of industry by occupation and education into the 18 job families used in this study, the computer printouts provided a great deal of information at the three digit industry level for both Ontario and Canada. This material runs to several hundred pages and it was not considered practical to reproduce all of it.⁽¹⁾ What we have attempted is to prepare a matrix which would summarize the computer printout while at the same time conveying information in a form suitable for analysis. What follows is a summary of the findings which, it is hoped, will provide a glimpse of both the forest and the trees.

Six matrixes have been prepared for the Ontario labour force. Tables 13, 14, and 15 present the data for total labour force as well as for the male and female components while Tables 16, 17, and 18 show the percentage distributions by educational achievement levels for total, males, and females, respectively.⁽²⁾

(1) These printouts may be consulted by arrangement with the Director of the Economic Planning Branch, Dept. of Treasury and Economics, Queen's Park, Toronto.

(2) See Appendix Tables A-1 to A-6 for Canadian data.

TABLE 13

MATRIX OF INDUSTRY/JOB FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, ONTARIO LABOUR FORCE, 1991

Industry Job Family	Education Level	Agriculture	Forestry	Fishing and Hunting	Mines, Quarries, and Oil	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Trade	Finance, Insurance, and Real Estate	Community, Business, and Personal Services	Public Administration	Total
Tools - Specialized	E	76	7,004	20	193	15,260	10,803	3,892	3,071	36	9,363	681	50,422
	S	27	1,796	9	329	18,302	5,822	9,167	3,013	95	6,252	1,241	46,033
	U	1	62	-	78	548	181	630	113	6	360	248	2,226
Tools - Non-specialized	E	307	1,314	96	3,285	73,823	49,454	19,080	30,914	2,129	16,955	12,118	210,185
	S	308	799	50	3,776	71,563	35,729	14,358	29,064	1,388	11,099	7,794	176,227
	U	15	41	3	144	2,349	1,039	631	935	87	629	268	7,712
Machines - Specialized	E	16	293	1,020	11,126	6,714	4,299	1,316	604	9	402	995	26,444
	S	9	150	298	10,127	6,908	2,764	1,880	665	23	998	1,006	24,606
	U	-	7	7	584	321	67	122	28	-	476	108	1,720
Machines - Non-specialized	E	190	320	282	1,002	83,272	3,214	1,402	7,534	120	2,337	1,258	110,722
	S	149	195	107	797	77,018	2,611	1,568	6,611	232	1,552	1,873	92,411
	U	5	3	2	37	2,189	86	62	163	12	103	72	7,707
Inspection	E	205	455	2	1,293	12,671	2,024	3,132	1,283	95	650	1,668	21,900
	S	254	328	10	1,203	29,432	3,958	8,052	2,792	249	1,669	4,861	41,882
	U	29	30	3	160	5,846	345	981	475	63	453	1,050	7,455
Vehicle Operation	E	411	608	12	1,340	13,102	3,568	23,924	13,646	35	2,247	2,576	61,466
	S	277	454	10	963	11,215	2,337	22,647	11,186	58	2,221	1,806	54,171
	U	5	15	-	28	267	63	783	254	3	64	41	1,483
Farm	E	93,599	24	-	-	190	1	14	283	1	245	220	94,579
	S	62,410	17	-	-	98	1	9	144	-	128	113	62,920
	U	2,769	1	-	-	4	-	1	6	-	8	6	2,795
Sales - Knowledge Required	E	22	9	-	41	6,455	75	845	3,495	1,654	262	114	12,013
	S	42	24	-	113	12,851	208	1,591	9,229	13,864	1,158	498	24,419
	U	2	3	-	15	1,076	58	160	915	207	80	5	5,944
Sales - Knowledge Not Required	E	66	3	-	9	3,160	106	161	22,292	27	833	24	26,481
	S	228	11	-	53	16,770	527	751	65,752	110	2,643	64	86,909
	U	37	1	-	11	3,545	106	143	6,756	16	382	3	10,000
Clerical	E	51	84	2	194	8,126	277	6,339	6,439	4,412	4,105	4,256	34,586
	S	516	497	10	1,638	67,223	51,759	43,483	46,577	47,375	29,851	104,658	292,411
	U	39	79	2	248	6,941	604	3,712	4,101	4,590	3,856	4,059	30,232
Personal Service	E	2,519	471	1	136	2,068	211	1,768	2,532	964	72,929	3,080	86,470
	S	1,694	326	1	94	1,534	137	1,412	2,247	710	60,521	2,047	70,821
	U	175	19	-	5	82	111	82	1,094	53	2,707	163	3,907
Entertainment	E	4	-	-	-	135	-	63	28	1	1,513	47	1,791
	S	14	-	-	1	1,085	2	372	219	13	5,310	182	7,198
	U	8	-	-	1	389	1	201	113	10	2,263	86	3,272
Protection	E	31	87	3	130	1,810	197	545	297	108	1,344	3,875	8,427
	S	40	133	7	199	2,474	262	632	423	156	2,001	14,112	20,861
	U	4	20	1	11	207	28	56	305	30	305	1,134	1,434
Education and Training	E	-	-	-	-	20	-	11	19	4	995	104	1,143
	S	-	-	-	-	40	-	24	29	7	25,189	327	25,617
	U	-	-	-	-	35	-	20	21	4	33,724	309	34,113
Health	E	36	1	-	36	185	3	42	59	5	10,866	240	11,444
	S	108	1	-	66	949	16	102	307	51	45,178	1,150	47,979
	U	417	-	-	39	879	4	84	2,332	68	79,521	885	82,978
Welfare	E	-	-	-	-	1	-	-	-	-	634	63	697
	S	-	-	-	-	11	-	-	-	-	3,551	568	4,110
	U	2	-	-	-	12	-	-	-	-	7,949	687	8,610
Administration and Organization	E	170	346	32	277	5,105	4,424	1,805	19,288	685	5,581	464	28,477
	S	411	831	67	601	26,312	9,257	7,712	10,572	42,162	10,952	9,024	116,414
	U	166	304	30	244	11,970	1,931	2,498	16,655	4,191	12,700	1,001	55,447
Research and Design	E	4	292	1	22	471	40	121	51	36	250	25	1,145
	S	23	287	6	251	5,871	471	1,398	561	357	2,918	2,117	16,583
	U	92	175	22	1,104	11,701	797	2,691	1,160	389	4,341	4,187	27,611
Total	E	97,929	11,343	1,472	19,096	242,708	79,797	66,482	109,824	10,321	131,311	32,538	860,701
	S	66,913	3,762	568	20,430	349,683	115,227	116,717	226,044	76,447	241,111	66,479	1,219,771
	U	3,764	761	70	2,696	46,191	5,470	12,650	32,348	12,898	32,188	14,164	278,460

(1) E - Elementary
S - Secondary
U - University

MATRIX OF INDUSTRY/JOB FAMILY EDUCATIONAL REQUIREMENT LEVELS, ONTARIO LABOUR FORCE, 1961

Indus- try Family	Educa- tion	Agriculture	Forestry	Fishing and Trapping	Mines, Quarries, and Oil Wells	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Trade	Finance, Insurance, and Personal Real Estate	Community, Social, and Personal Services	Public Adminis- tration	Total
Tools - Specialized	E	70	7,021	20	192	4,350	10,798	3,869	1,519	24	2,598	612	28,074
	S	12	1,793	9	239	15,172	5,418	9,150	1,877	84	1,232	1,176	37,753
	U	1	62	-	78	351	181	629	67	6	276	265	2,083
Tools - Non-specialized	E	464	1,668	69	3,275	67,819	49,712	18,809	29,113	1,925	12,999	11,517	186,430
	S	272	761	35	3,764	67,862	35,661	16,401	27,410	9,487	9,487	168,085	
	U	172	39	2	164	2,303	1,037	620	930	42	393	5,582	
Machines - Specialized	E	16	192	1,012	11,122	5,458	4,299	1,310	562	8	318	987	25,275
	S	9	167	294	10,123	6,151	2,766	1,853	423	23	90	986	23,676
	U	-	7	7	584	306	67	119	25	-	423	99	1,637
Machines - Non-specialized	E	77	117	281	995	59,179	3,183	1,319	5,497	120	2,144	1,222	76,115
	S	72	107	89	901	55,981	2,239	1,512	5,220	232	2,411	1,691	70,644
	U	3	3	2	1,994	32	66	12	169	12	302	72	2,454
Inspection	E	87	455	2	1,290	30,546	3,052	3,050	1,058	91	363	1,630	29,664
	S	154	325	180	1,188	27,178	2,881	7,841	2,533	234	1,338	4,562	48,115
	U	29	29	3	154	3,660	344	964	438	60	342	962	8,951
Vehicle Operation	E	609	607	12	1,339	13,073	3,566	23,864	13,596	32	2,189	2,568	61,277
	S	272	452	10	963	11,137	2,330	23,486	10,963	36	2,056	1,773	51,297
	U	5	15	-	28	263	63	775	235	5	36	39	1,462
Farm	E	81,015	21	-	-	168	1	14	218	1	238	219	81,906
	S	32,909	15	-	-	82	1	9	105	-	123	113	33,137
	U	2,482	1	-	-	6	-	1	5	-	8	6	2,506
Sales - Knowledge Required	E	20	9	-	40	6,342	74	835	3,262	1,430	214	108	12,313
	S	30	26	-	116	11,720	288	1,221	7,521	12,611	659	459	35,049
	U	1	3	-	15	1,006	125	155	765	2,313	182	76	5,584
Sales - Knowledge Not Required	E	37	1	-	7	2,231	90	131	8,597	15	247	10	11,317
	S	151	9	-	67	13,964	477	653	31,515	74	1,082	28	48,001
	U	28	1	-	11	3,415	101	127	4,551	14	270	2	8,232
Clerical	E	11	72	1	165	4,402	2,832	3,672	2,467	1,027	1,010	1,944	15,462
	S	92	342	6	936	23,753	1,937	21,458	9,868	9,108	1,640	1,308	48,308
	U	17	70	1	208	4,748	429	2,774	2,235	2,667	1,544	18,803	
Personal Service	E	2,355	298	-	101	1,193	155	1,927	682	488	20,688	2,461	24,724
	S	1,545	204	-	65	790	127	928	490	321	16,983	1,570	22,996
	U	167	16	-	4	55	7	73	26	22	1,601	127	1,508
Entertainment	E	4	-	-	-	126	-	43	25	1	1,188	62	1,457
	S	12	-	-	1	606	1	231	155	10	1,046	42	1,526
	U	8	-	-	1	461	1	136	69	8	1,106	63	1,651
Protection	E	21	86	3	130	1,803	186	562	283	103	1,308	3,723	6,216
	S	40	130	7	199	2,453	260	1,043	389	166	1,896	13,768	20,712
	U	4	19	1	11	193	29	60	27	12	531	117	1,017
Education and Training	E	-	-	-	-	12	-	8	7	3	377	60	467
	S	-	-	-	-	33	-	21	17	6	4,562	183	4,822
	U	-	-	-	-	31	-	13	6	10,937	216	17,216	
Health	E	51	1	-	36	106	-	23	37	2	3,776	343	4,193
	S	90	1	-	55	337	1	25	168	2	5,766	275	7,111
	U	407	-	-	25	276	-	15	2,066	63	10,528	360	12,559
Welfare	E	-	-	-	-	1	-	-	-	-	304	42	347
	S	-	-	-	-	8	-	-	-	-	1,622	391	2,023
	U	2	-	-	-	8	-	-	-	-	6,197	383	6,592
Administration and Organization	E	163	564	32	274	4,863	4,390	1,679	16,334	566	8,004	807	23,134
	S	267	825	66	388	26,382	9,618	6,817	35,770	9,943	15,035	8,104	111,256
	U	153	303	19	260	11,392	1,888	2,731	16,017	4,016	11,633	5,295	51,160
Research and Design	E	4	701	1	22	452	40	111	63	31	209	203	1,316
	S	283	286	6	267	5,708	468	1,327	695	313	2,374	2,175	13,621
	U	89	176	22	1,102	11,509	993	2,614	1,063	328	3,938	4,679	26,511
Total	E	86,794	10,875	1,634	18,968	189,326	78,830	60,797	83,300	3,367	53,663	28,208	615,829
	S	56,061	5,621	532	19,600	289,616	66,127	92,305	138,039	24,901	58,201	850,126	850,126
	U	3,496	763	67	2,633	62,106	5,234	11,220	26,938	10,550	56,636	16,230	179,554

(1) F - Elementary

S - Secondary

U - University

TABLE 15

MATRIX OF INDUSTRY/JOB FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, ONTARIO LABOUR FORCE, 1991S, 1991

Industry (F.W.I.)	Education Level	Agriculture	Forestry	Fishing and Trapping	Mines, Quarries, and Oil Wells	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Trade	Finance, Insurance, and Real Estate	Community, Business, and Personal Services	Public Admini- stration	Total
Tools - Specialized	E	7	5	-	-	3,910	5	22	1,552	12	6,746	70	12,348
	S	4	2	-	-	3,130	4	18	1,136	11	3,929	65	8,000
	U	-	-	-	-	66	-	1	27	-	64	6	161
Tools - Non-specialized	E	63	66	29	21	4,105	162	271	1,801	707	3,956	602	13,755
	S	36	36	15	12	3,700	88	155	1,654	391	2,210	337	8,636
	U	2	2	1	-	66	2	3	25	6	120	5	120
Machines - Specialized	E	-	1	8	6	1,255	-	6	62	-	76	8	1,418
	S	-	3	6	2	757	-	15	61	-	68	20	929
	U	-	-	-	-	15	-	3	3	-	53	9	83
Machines - Non-specialized	E	113	2	2	8	34,093	30	83	2,037	-	193	36	36,596
	S	77	2	1	6	21,637	22	56	1,382	-	140	34	23,103
	U	1	-	-	-	195	-	1	16	-	2	-	213
Inspection	E	117	-	-	3	2,125	2	72	183	4	88	58	2,656
	S	100	-	-	15	2,279	6	181	259	16	333	279	3,467
	U	6	1	-	0	226	1	17	37	3	111	107	515
Vehicle Operation	E	2	1	-	-	29	2	59	50	3	57	6	209
	S	6	1	-	-	78	7	161	222	22	165	23	696
	U	-	-	-	-	4	-	7	19	1	8	2	41
Farms	E	12,585	2	-	-	22	-	-	58	-	7	1	12,672
	S	9,501	2	-	-	16	-	-	39	-	5	1	9,564
	U	287	-	-	-	-	-	-	1	-	-	-	289
Sales - Knowledge Required	E	2	-	-	-	154	2	13	254	324	68	7	700
	S	13	-	-	1	1,132	11	70	1,708	1,212	348	49	4,155
	U	1	-	-	-	70	1	5	150	123	25	4	360
Sales - Knowledge Not Required	E	28	1	-	2	928	16	30	13,685	12	587	16	15,314
	S	27	1	-	6	2,007	50	98	34,238	36	1,581	36	38,908
	U	9	-	-	-	130	5	5	1,295	1	112	1	1,448
Clerical	E	40	12	1	69	3,524	285	2,467	3,972	3,385	3,895	2,313	19,344
	S	626	155	12	705	41,472	3,180	21,963	38,744	38,759	28,459	26,605	208,120
	U	12	9	1	40	2,193	178	938	1,866	1,923	2,747	1,515	11,430
Personal Service	E	164	173	1	26	875	56	480	1,840	476	52,261	620	56,941
	S	149	123	1	29	746	36	485	1,856	389	43,138	477	47,829
	U	8	3	-	1	27	1	38	68	31	1,395	15	1,399
Entertainment	E	-	-	-	-	-	-	20	3	-	326	5	363
	S	1	-	-	-	180	-	121	86	3	2,264	39	2,673
	U	-	-	-	-	128	-	63	44	2	1,158	23	1,421
Protection	E	-	1	-	-	6	1	3	13	4	36	152	217
	S	1	3	-	1	21	1	9	25	10	103	364	529
	U	-	-	-	-	12	-	4	11	4	48	49	129
Education and Training	E	-	-	-	-	8	-	3	12	1	618	44	666
	S	-	-	-	-	7	-	4	12	1	20,828	144	20,795
	U	-	-	-	-	5	-	2	8	-	16,787	95	16,897
Health	E	5	-	-	1	79	2	19	22	3	7,090	157	7,319
	S	18	1	-	11	612	16	77	165	69	29,414	873	41,215
	U	10	-	-	4	205	3	29	238	23	9,995	337	10,834
Welfare	E	-	-	-	-	-	-	-	-	-	329	21	350
	S	-	-	-	-	-	-	-	-	-	1,928	157	2,087
	U	-	-	-	-	-	-	-	-	-	1,733	193	2,026
Administration and Organization	E	7	3	-	3	262	33	127	955	161	2,016	157	3,764
	S	64	6	1	16	1,730	201	984	633	4,916	820	820	15,702
	U	11	2	-	6	507	42	248	1,638	174	1,246	406	4,357
Research and Design	E	-	1	-	-	20	-	10	8	5	62	32	114
	S	2	1	-	-	163	3	71	66	46	346	263	606
	U	3	1	-	6	191	4	76	77	60	308	60	606
Total	E	15,134	268	39	128	53,383	378	3,665	26,515	4,976	77,668	4,260	111,777
	S	10,532	340	34	803	80,218	2,205	24,430	88,003	39,344	160,183	30,377	219,223
	U	538	19	2	61	6,085	239	1,441	5,620	2,348	35,754	3,163	42,000

(1) E - Elementary
S - Secondary
U - University

In view of the large amount of information available from these matrixes, only some of the most pertinent applications will be pointed out. Rather than catalogue all conclusions, it is here intended to show how the matrix format can be used as an analytical tool.

From Table 13 it can be seen that the largest number of persons in the Ontario labour force were in the secondary educational achievement level. Within that level, the clerical job family accounted for the largest number. Taken one step further, within the clerical job family itself, manufacturing was the industry in which the largest number of persons with a secondary achievement level were employed. Other educational achievement levels can also be traced in order to determine in which industry and job family they are particularly significant.

The matrix format also permits isolation of educational achievement levels by industry and focuses on key job families within that industry. In the case of agriculture, for example, the totals for the first columns reveal that elementary educational achievement levels are the most important. Further examination of the column indicates that the farm job family accounts for practically all such persons.

The percentage distributions shown in matrix Tables 16, 17 and 18 form a useful basis in preparing projections of educational requirements after labour force demands have been derived by industry. This will form the next phase of a series of studies currently being undertaken in Economic Planning Branch.

TABLE 16

MATRIX OF INDUSTRY/208 FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, PERCENTAGE DISTRIBUTION, ONTARIO LABOUR FORCE, 1961

Industry	Education	Agriculture	Forestry	Fishing and Trapping	Mines, Quarrying and Oil Wells	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Finance, Insurance, and Real Estate	Government and Public Administration	Total
Tools - Specialized	E	73.2	79.1	69.4	32.1	-6.7	64.3	28.4	49.6	26.5	51.1
	S	26.1	20.2	29.8	26.9	-3.6	34.8	67.0	48.6	69.2	60.7
	U	0.7	0.7	0.8	15.0	1.7	1.1	4.8	1.8	4.2	11.4
Tools - Non-specialized	E	61.1	61.0	64.3	45.7	-0.0	57.5	56.0	59.8	59.7	58.3
	S	37.1	37.1	33.8	53.3	-0.4	41.2	42.7	38.9	40.2	45.0
	U	1.8	1.9	1.9	1.0	1.6	1.2	1.3	1.3	1.3	1.5
Machines - Specialized	E	63.4	55.2	77.0	50.9	48.1	60.5	39.7	55.1	26.8	47.2
	S	36.0	42.7	22.5	48.4	-0.6	38.6	58.4	41.7	52.2	47.7
	U	0.6	2.1	0.5	3.7	2.3	0.9	3.7	2.5	1.5	25.4
Machines - Non-specialized	E	55.5	51.8	75.4	49.6	54.1	58.0	44.2	52.7	32.9	46.8
	S	43.5	46.9	24.0	48.8	-4.8	40.8	51.7	46.2	45.8	51.1
	U	1.0	1.5	0.6	1.6	1.1	1.1	3.3	2.3	2.5	3.3
Inspection	E	41.9	56.0	17.0	48.7	37.6	37.3	25.8	22.8	23.4	17.5
	S	52.1	40.3	85.5	45.3	74.0	56.3	68.1	61.4	61.0	64.9
	U	6.0	3.7	17.5	6.0	8.4	6.4	8.1	10.4	15.6	17.6
Vehicle Operation	E	59.3	36.4	55.1	57.5	-3.3	60.0	49.5	54.4	36.5	49.6
	S	40.0	42.8	43.5	41.3	-2.7	39.3	48.9	44.6	59.8	49.0
	U	0.7	1.6	1.4	1.2	4.0	1.0	1.6	1.0	3.4	1.4
Farm	E	59.0	58.0	-	61.0	-5.0	59.8	61.0	65.4	61.0	64.3
	S	39.3	39.9	-	35.4	13.5	36.5	36.2	33.2	35.4	33.7
	U	1.7	2.1	-	3.4	1.5	3.7	2.8	1.4	3.4	2.0
Sales - Knowledge Required	E	23.3	26.3	-	23.9	11.8	17.4	22.4	23.4	8.7	16.1
	S	63.9	65.9	-	67.4	62.9	71.1	61.3	67.7	72.1	71.9
	U	2.8	7.8	-	8.7	5.3	11.5	6.1	6.7	18.2	11.6
Sales - Knowledge Not Required	E	19.9	18.8	-	12.8	13.5	14.3	15.3	23.8	17.5	21.6
	S	69.0	71.2	-	73.2	71.4	71.3	71.2	70.1	72.1	68.5
	U	11.1	10.0	-	14.0	15.1	14.4	13.5	6.1	9.9	9.9
Clerical	E	8.5	12.7	8.4	9.3	7.9	9.0	11.9	10.3	7.9	7.2
	S	85.1	75.7	81.8	78.7	81.7	81.5	81.2	83.1	83.8	82.6
	U	6.4	12.0	9.8	12.0	8.4	9.5	6.9	6.6	8.3	10.2
Personal Service	E	57.4	57.7	53.4	57.8	54.1	59.2	53.7	50.7	55.8	53.8
	S	38.4	39.9	45.2	39.9	-1.7	38.3	44.6	41.1	47.2	44.6
	U	4.0	2.4	1.4	2.3	2.2	2.5	3.4	2.1	3.1	1.6
Entertainment	E	16.2	-	-	2.9	7.5	3.9	9.9	7.7	2.9	16.7
	S	52.0	-	-	53.4	60.0	53.8	58.5	60.9	53.9	56.4
	U	31.8	-	-	43.7	32.5	43.3	31.6	31.4	43.2	26.9
Protection	E	41.2	35.3	25.7	38.2	-0.3	40.3	32.8	39.1	38.5	30.3
	S	52.7	55.3	66.4	58.4	51.1	53.7	55.9	57.0	55.9	60.9
	U	5.1	8.2	7.4	3.2	4.6	6.0	3.9	5.0	5.8	4.7
Education and Training	E	-	-	-	-	11.0	-	20.2	27.8	26.0	1.7
	S	-	-	-	-	41.8	-	44.3	42.2	46.7	42.0
	U	-	-	-	-	17.8	-	20.3	27.3	26.3	56.0
Health	E	9.7	36.9	49.5	77.8	11.5	13.8	22.6	2.0	4.3	10.5
	S	18.5	54.2	45.2	50.2	58.8	70.5	54.3	10.6	41.0	50.6
	U	71.8	8.9	5.3	22.0	29.7	16.6	23.3	87.4	54.7	38.9
Welfare	E	2.1	-	-	-	3.0	-	-	-	-	5.2
	S	12.3	-	-	-	43.1	-	-	-	-	62.9
	U	84.6	-	-	-	49.8	-	-	-	-	32.2
Administration and Organization	E	22.7	32.5	26.6	24.7	11.8	28.3	15.0	23.0	4.4	16.6
	S	55.0	49.4	51.2	53.6	60.6	59.3	64.3	56.2	68.5	57.2
	U	23.0	18.1	22.2	21.7	27.6	12.4	20.7	20.8	27.1	26.7
Research and Design	E	3.6	30.4	4.5	1.4	-	3.7	3.9	2.9	4.7	1.3
	S	63.3	63.3	80.4	88.2	81.2	81.2	81.2	81.2	81.2	81.2
	U	75.9	26.3	75.1	80.2	-	66.1	63.9	65.1	69.1	65.1
Total	E	58.2	63.1	69.9	45.3	10.0	51.9	33.3	30.8	10.6	38.3
	S	39.4	32.6	26.8	48.2	7.8	44.5	60.2	41.4	78.2	51.9
	U	2.2	4.3	3.3	6.4	7.2	3.8	6.5	8.8	13.2	10.0

(1) E - Elementary
S - Secondary
U - University

TABLE 17

MATRIX OF INDUSTRY AND FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, EDUCATIONAL DISTRIBUTION, ONTARIO LABOUR FORCE, MALES, 1963

Industry	Education	Elementary	Secondary	University	Fishing and Transp.	Min. Quarries and Oil	Manufacturing	Construction	Transportation, Communication and Other	Trade	Finance, Insurance and Real Estate	Community, Business and Personal	Public Admin.	Total
Tools - Specialized	E	74.8	79.4	80.5	32.4	5.3	5.3	24.4	14.4	14.4	14.4	14.4	14.4	14.4
	S	74.5	70.2	29.7	29.7	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
	U	0.7	0.7	0.8	11.0	1.6	1.1	4.4	2.4	2.4	2.4	2.4	2.4	2.4
Tools - Non-specialized	E	40.9	10.9	44.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
	S	37.3	17.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
	U	1.8	4.4	2.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Machines - Specialized	E	63.4	55.4	77.1	54.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	30.0	44.4	22.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	0.6	2.1	0.5	2.7	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Machines - Non-specialized	E	40.4	11.4	75.5	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	37.4	17.4	22.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	1.8	1.5	0.9	1.9	2.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Inspection	E	12.7	44.4	17.1	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	58.0	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	4.2	2.1	1.7	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Vehicle Operation	E	54.7	44.4	5.1	57.5	70.7	60.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	39.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	9.7	1.4	1.4	1.2	1.0	0.7	4.4	1.0	1.2	1.4	1.4	1.4	1.4
Farm	E	54.4	44.4	14.0	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	38.7	44.4	37.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	4.4	2.2	4.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Sales - Knowledge Required	E	34.8	26.1	24.0	24.0	31.3	17.4	11.2	11.2	11.2	11.2	11.2	11.2	11.2
	S	57.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	4.4	7.8	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Sales - Knowledge Not Required	E	17.2	17.4	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1
	S	49.8	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4
Clerical	E	12.2	44.4	12.4	12.4	10.4	11.0	11.4	11.4	11.4	11.4	11.4	11.4	11.4
	S	74.8	72.7	72.4	72.4	71.4	72.9	74.4	74.4	74.4	74.4	74.4	74.4	74.4
	U	14.0	14.7	15.3	15.3	15.5	15.1	14.4	14.4	14.4	14.4	14.4	14.4	14.4
Personal Service	E	47.9	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	44.0	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4
Entertainment	E	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Protection	E	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	0.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Education and Training	E	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Health	E	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Welfare	E	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Administration and Organization	E	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
Research and Design	E	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
Total	E	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	S	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
	U	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4

(1) E - Elementary

S - Secondary

U - University

TABLE 18

MAJORS OF INDUSTRY/100 FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, FREQUENCY DISTRIBUTION, ONTARIO LABOUR FORCE, 1961

Industry	Education	Agriculture	Forestry	Fishing and Trapping	Mines, Quarries, and Oil Wells	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Trade	Finance, Insurance, and Real Estate	Community, Business, and Personal Service	Public Administration	Total
Job Family													
Tools - specialized	E	59.3	68.2	63.4	57.0	55.2	56.1	55.1	57.3	50.6	62.9	50.2	59.6
	S	60.3	71.7	35.6	42.5	46.2	43.7	43.1	41.8	48.6	36.5	47.2	39.9
	U	0.4	0.1	1.0	0.5	0.6	0.6	1.8	1.0	0.8	0.6	2.6	0.7
Tools - Non-specialized	E	62.4	62.4	62.3	63.5	62.0	63.3	63.3	51.8	63.9	65.8	63.7	61.1
	S	35.9	35.9	35.8	35.8	37.5	37.9	38.1	47.5	35.6	31.7	38.3	38.3
	U	1.7	1.7	1.9	0.7	0.5	0.8	0.6	0.7	0.5	0.6	0.6	0.6
Machines - Specialized	E	-	27.6	68.7	68.7	61.9	-	34.3	58.5	39.9	34.4	21.9	58.4
	S	-	69.5	21.3	31.3	37.3	-	62.8	39.0	59.0	40.8	33.6	38.2
	U	-	2.9	0.0	0.0	0.8	-	12.9	1.5	1.1	26.8	3.4	3.4
Machines - Non-specialized	E	59.2	37.9	64.2	57.0	61.2	57.3	59.3	56.3	-	57.5	50.9	61.0
	S	60.4	41.7	35.5	42.8	38.5	40.3	40.4	40.4	-	42.0	48.4	38.6
	U	0.6	0.3	0.3	0.4	0.3	0.4	0.4	0.4	-	0.5	0.7	0.4
Inspection	E	52.9	1.0	10.7	11.7	45.9	24.8	28.7	38.4	19.6	16.5	13.1	40.0
	S	45.1	63.6	70.9	63.6	49.2	63.6	66.9	55.9	64.8	62.5	62.7	51.2
	U	2.0	25.4	18.4	24.7	4.9	11.6	4.9	5.5	21.0	24.2	21.8	7.8
Vehicle Operation	E	37.0	26.9	11.1	11.1	26.1	23.4	26.1	17.1	11.7	24.8	14.5	22.1
	S	70.2	70.1	84.4	84.4	72.7	70.8	76.5	69.8	71.7	60.7	73.5	73.5
	U	2.9	3.0	4.5	4.5	3.4	3.7	3.1	6.4	4.5	3.5	4.8	4.4
Form	E	56.2	55.8	-	-	57.3	-	42.5	58.0	-	56.7	35.2	51.5
	S	62.5	62.8	-	-	41.3	-	58.1	60.9	-	62.0	42.5	42.5
	U	1.3	1.4	-	-	1.3	-	3.4	1.1	-	1.3	1.5	1.3
Sales - Knowledge Required	E	11.1	-	-	11.1	13.3	11.7	12.3	12.0	14.2	11.4	11.0	12.4
	S	84.4	-	-	84.4	83.5	88.7	81.7	80.9	77.9	82.7	81.5	86.9
	U	4.5	-	-	4.5	5.2	7.6	6.0	7.1	7.9	5.8	7.5	6.7
Sales - Knowledge Not Required	E	25.0	28.3	-	26.5	24.0	23.0	22.5	27.9	26.4	26.0	28.3	27.5
	S	62.4	69.9	-	70.9	72.6	73.2	73.4	69.7	72.8	69.1	69.9	69.9
	U	7.4	1.8	-	2.4	3.4	4.8	4.1	2.4	2.8	4.9	1.8	7.6
Clerical	E	8.3	6.8	5.6	6.2	7.5	7.7	9.7	8.9	8.0	7.0	7.7	8.0
	S	87.2	88.2	88.4	88.7	87.9	87.6	86.6	86.5	87.4	86.8	87.2	87.2
	U	4.5	5.0	6.0	5.1	4.6	4.7	4.2	4.6	6.2	5.0	4.8	4.8
Personal Service	E	51.2	57.9	53.7	53.8	53.1	59.8	66.8	48.9	53.1	53.9	55.7	53.6
	S	68.4	63.0	63.2	63.3	65.3	39.3	49.4	49.3	43.4	44.9	62.9	55.1
	U	2.4	1.1	1.1	2.2	1.6	0.9	3.8	1.8	3.5	1.2	1.4	1.3
Entertainment	E	23.4	-	-	2.8	2.8	3.8	9.7	3.0	2.8	8.7	7.1	8.1
	S	59.5	-	-	56.9	56.9	58.9	57.2	56.9	60.4	58.2	60.0	60.0
	U	17.1	-	-	40.3	40.3	40.3	31.5	39.7	60.3	30.9	34.7	31.9
Protection	E	26.2	29.9	5.3	27.2	16.3	25.8	18.7	22.9	20.0	19.1	27.9	26.8
	S	61.8	62.6	43.6	62.6	53.2	61.4	55.8	58.8	56.3	55.6	63.2	60.5
	U	12.0	7.5	51.1	10.2	30.5	22.8	25.4	18.2	23.7	25.3	8.8	16.7
Education and Training	E	-	-	-	-	39.9	-	32.4	26.3	58.3	1.6	1.6	1.8
	S	-	-	-	-	36.3	-	39.9	37.1	27.6	56.2	50.9	56.2
	U	-	-	-	-	23.8	-	27.7	36.6	14.1	44.1	33.7	44.0
Health	E	16.4	23.4	-	3.6	8.8	11.8	15.4	5.5	4.5	12.5	7.4	12.3
	S	53.9	59.5	-	70.4	68.3	72.1	61.5	58.8	66.7	60.8	69.9	69.4
	U	29.7	17.1	-	26.0	22.9	16.1	23.1	37.7	30.8	17.7	25.7	18.3
Welfare	E	-	-	-	-	4.5	-	-	-	-	8.2	4.5	7.8
	S	-	-	-	-	24.1	-	-	-	-	48.1	36.1	46.6
	U	-	-	-	-	61.4	-	-	-	-	43.7	61.4	45.5
Administration and Organization	E	11.2	24.0	8.7	15.9	9.4	12.1	9.6	10.6	16.8	23.4	11.4	15.8
	S	70.9	59.7	60.5	65.5	67.6	72.6	71.7	66.8	59.3	59.5	59.3	55.9
	U	17.9	16.3	30.8	18.6	22.0	15.2	18.7	18.2	18.4	15.1	29.3	18.2
Research and Design	E	5.3	25.7	5.3	5.3	5.3	5.3	4.5	5.3	5.3	5.3	5.3	5.4
	S	43.6	39.6	43.6	43.6	43.6	43.6	45.1	45.4	45.6	43.6	43.6	43.7
	U	51.1	34.7	51.1	51.1	51.1	51.1	48.4	51.1	51.1	51.1	51.1	50.9
Total	E	56.9	62.7	51.9	12.9	30.7	12.8	12.4	22.1	10.6	18.4	11.2	27.3
	S	43.6	54.2	45.0	80.0	58.3	82.0	72.4	66.4	64.6	58.3	60.4	66.9
	U	1.5	3.0	3.1	6.1	3.0	5.2	4.9	4.5	5.0	13.1	8.4	7.8

(1) E - Elementary
S - Secondary
U - University

TABLE A-1

MATRIX OF INDUSTRY/JOB FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, CANADA LABOUR FORCE, 1981

Industry	Education Level	Education Level										Total	
		Agriculture	Forestry	Fishing and Trapping	Mines, Quarries, and Oil	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Trade	Finance, Insurance, and Real Estate	Community, Business, and Personal Services		Public Administration
Tools - Specialized	E	313	48,375	224	663	44,164	26,395	16,939	8,334	69	26,430	2,298	173,706
	S	91	12,565	108	1,009	43,202	13,989	20,117	8,058	161	10,065	3,580	128,861
	U	3	643	3	233	1,361	689	1,717	314	12	904	670	6,126
Tools - Non-specialized	E	1,598	4,738	318	10,068	171,321	165,158	65,260	80,955	5,619	45,727	29,264	569,992
	S	957	3,145	167	10,323	156,086	104,233	48,081	77,256	3,421	30,862	25,812	460,498
	U	45	167	8	8	3,156	3,806	1,483	2,427	115	1,139	853	7,771
Machines - Specialized	E	106	868	22,483	28,262	19,576	12,014	6,503	1,661	18	1,033	3,227	71,112
	S	54	603	15,548	25,047	16,874	7,721	6,465	1,167	33	2,668	3,469	77,127
	U	1	23	145	1,427	710	193	426	71	1	1,257	320	7,771
Machines - Non-specialized	E	322	1,270	2,726	2,580	216,193	8,078	4,137	20,366	250	6,854	3,666	264,819
	S	255	998	1,056	2,690	163,016	6,448	1,408	17,009	160	6,037	3,418	207,955
	U	6	27	21	96	6,768	175	167	435	26	268	193	6,100
Inspection	E	510	2,838	50	3,719	23,279	5,535	8,684	3,514	199	1,261	4,496	56,088
	S	718	1,906	163	3,495	57,505	8,430	22,981	7,688	343	6,650	11,408	119,407
	U	160	143	34	354	7,611	963	2,264	1,322	148	1,153	2,292	17,357
Vehicle Operation	E	985	4,655	115	3,915	32,152	12,841	26,014	36,192	81	6,292	8,074	178,235
	S	683	3,258	167	2,812	27,767	8,146	23,007	39,603	126	6,432	5,810	160,403
	U	12	69	11	79	613	157	2,634	695	8	179	131	4,588
Farm	E	361,138	95	-	1	453	4	61	507	1	1,106	637	364,024
	S	242,750	54	-	1	231	3	37	255	1	569	340	244,320
	U	10,898	3	-	11	-	-	2	11	-	30	59	10,963
Sales - Knowledge Required	E	34	26	-	124	12,115	233	2,430	8,691	3,683	567	269	28,163
	S	73	81	-	372	24,805	876	4,392	21,757	31,797	2,518	1,043	87,054
	U	3	11	-	49	2,027	340	425	2,100	7,947	456	162	11,727
Sales - Knowledge Not Required	E	133	17	-	32	7,203	268	425	61,250	77	2,193	93	71,787
	S	441	65	-	165	37,229	1,236	1,849	181,655	321	6,734	269	231,065
	U	64	10	-	32	7,802	328	736	16,267	68	874	13	25,585
Clerical	E	134	403	16	777	15,125	1,522	17,591	15,936	9,942	9,930	10,018	81,307
	S	1,202	2,368	151	7,160	128,994	13,912	123,222	131,416	106,690	112,252	92,697	774,536
	U	96	369	18	1,132	14,003	1,796	10,971	11,146	10,551	14,314	9,841	76,127
Personal Service	E	6,472	2,284	103	655	4,496	848	6,497	6,210	2,308	198,209	8,828	234,910
	S	6,396	1,587	48	666	3,263	923	5,125	5,770	1,713	165,243	5,562	181,275
	U	457	92	3	25	182	33	374	238	140	5,845	683	7,809
Entertainment	E	7	-	-	-	259	-	188	59	1	2,746	184	3,375
	S	22	-	-	3	2,119	4	1,072	474	25	12,976	441	12,317
	U	14	-	-	3	1,172	3	572	267	20	5,262	175	7,276
Protection	E	57	452	81	387	3,810	622	1,791	874	284	3,993	10,059	21,343
	S	74	706	402	554	5,460	823	3,483	1,262	611	6,022	27,556	77,772
	U	7	69	22	32	441	76	195	102	35	457	1,505	2,777
Education and Training	E	-	-	-	-	33	-	66	58	9	4,108	268	4,582
	S	-	-	-	-	77	-	164	82	16	80,347	904	81,438
	U	-	-	-	-	69	-	81	83	9	104,515	893	105,111
Health	E	115	45	14	40	459	30	120	150	11	27,223	562	28,589
	S	240	39	12	141	2,039	66	279	755	92	117,253	2,766	121,771
	U	978	6	1	56	1,111	10	119	6,219	111	53,056	2,171	60,719
Welfare	E	1	-	-	-	2	-	-	-	-	2,455	155	2,610
	S	6	-	-	-	30	-	-	-	-	12,811	1,370	13,117
	U	23	-	-	-	21	-	-	-	-	25,667	1,652	26,543
Manufacturing and Organization	E	431	2,811	123	1,033	11,268	10,884	5,417	48,127	1,723	14,615	2,306	78,877
	S	986	4,065	279	2,252	56,406	22,576	26,921	116,611	26,279	50,978	29,186	272,771
	U	397	1,279	127	1,017	26,022	4,405	7,693	43,342	10,355	31,794	11,314	77,771
Research and Design	E	24	974	18	96	957	99	355	110	63	403	513	1,779
	S	187	1,254	32	1,110	11,013	1,849	3,286	1,238	840	6,791	4,888	11,744
	U	600	760	135	4,622	21,972	2,601	7,882	2,544	721	10,806	10,437	27,771
Total	E	372,361	71,049	26,270	52,349	563,886	223,312	208,898	293,834	26,138	356,481	94,926	1,017,771
	S	235,058	32,738	8,953	58,020	736,107	14,592	352,182	605,087	172,748	661,010	221,559	1,417,771
	U	15,672	2,451	339	9,737	96,971	14,592	27,744	67,682	30,205	259,138	64,864	377,771

(1) E - Elementary
S - Secondary
U - University

TABLE A-2

RATES OF THERMIST/225 FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, CANADA LABOR FORCE, MALES, 1951

Industry	Education	Agriculture	Forestry	Fishing and Trapping	Mines, Quarries, and Oil Wells	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Trade	Finance, Insurance, and Real Estate	Community, Business, and Personal Services	Public Administration	Total
Job Family	Elementary												
Tools - Specialized	E	303	49,530	221	661	34,643	26,579	16,837	4,654	43	7,212	2,017	160,560
	S	84	12,474	105	1,005	36,259	12,916	28,027	5,243	143	6,283	3,345	107,185
	U	3	641	3	128	1,264	427	1,713	249	11	702	5,761	
Tools - Non-specialized	E	1,453	4,626	284	9,986	158,015	144,801	64,764	77,498	3,646	35,453	37,815	538,608
	S	875	3,079	148	10,487	148,924	104,095	47,578	76,443	2,437	25,346	24,282	441,585
	U	41	144	7	410	5,936	3,001	1,672	2,381	101	1,939	840	14,491
Machines - Specialized	E	106	866	22,384	28,227	16,327	12,014	4,481	1,472	845	3,198	89,931	
	S	34	599	6,503	25,041	16,952	7,741	1,036	6,291	34	2,438	68,176	
	U	1	23	145	1,427	178	193	419	63	1	1,106	307	4,263
Machines - Non-specialized	E	149	1,261	3,738	2,551	126,487	6,594	3,921	15,138	230	6,273	3,571	179,830
	S	135	992	832	2,468	114,580	5,953	4,206	14,409	446	6,235	4,452	155,028
	U	5	27	21	95	4,273	175	165	401	24	262	153	5,502
Inspection	E	259	2,831	48	3,707	21,131	5,532	8,508	3,084	191	1,021	1,021	
	S	453	1,893	124	3,223	22,010	8,421	22,522	6,522	513	1,781	10,882	112,103
	U	85	129	30	495	7,161	982	1,208	1,611	990	2,691	16,140	
Vehicle Operation	E	978	4,653	115	3,914	32,081	12,833	72,819	36,959	85	6,125	8,060	178,724
	S	666	3,353	167	2,811	27,572	8,730	72,389	39,025	90	5,869	5,740	154,521
	U	11	69	11	79	605	137	648	5	158	127	4,482	
Farm	E	319,221	89	-	1	407	4	61	433	1	1,011	654	321,882
	S	210,281	50	-	1	197	3	37	202	1	699	338	212,298
	U	9,891	3	-	0	10	0	2	10	0	28	19	9,962
Sales - Knowledge Required	E	33	25	-	123	11,823	210	2,394	8,157	3,233	468	257	26,745
	S	48	79	-	343	21,662	856	4,241	18,186	29,232	1,786	937	77,779
	U	2	11	-	49	1,894	138	1,789	7,597	401	155	12,548	
Sales - Knowledge Not Required	E	57	14	-	26	5,187	228	375	26,179	48	719	64	32,847
	S	266	59	-	149	31,201	1,124	1,376	96,448	233	2,844	130	137,311
	U	47	9	-	31	7,557	226	322	13,319	44	619	10	22,165
Clerical	E	29	366	11	553	8,510	891	11,056	6,424	2,585	2,714	5,130	38,259
	S	254	1,656	66	3,761	21,449	6,217	21,617	24,651	36,800	26,822	268,122	
	U	43	330	12	931	9,807	1,364	8,425	6,500	6,719	8,103	68,135	
Personnel Service	E	5,990	1,787	86	495	2,724	641	5,037	1,705	1,255	53,206	7,026	79,953
	S	3,988	1,226	53	332	1,830	425	3,593	1,218	829	43,680	4,509	61,690
	U	438	82	3	21	129	264	19	264	88	57	2,641	6,032
Entertainment	E	6	-	-	-	243	-	-	318	52	1	2,875	3,440
	S	10	-	-	3	1,783	4	707	331	20	7,070	343	10,283
	U	13	-	-	2	934	3	387	148	17	2,540	126	4,170
Protection	E	56	447	81	386	3,868	822	1,691	839	277	3,857	9,780	21,903
	S	72	696	402	352	5,416	822	3,377	1,169	3,613	26,720	25,444	
	U	7	68	22	31	432	164	78	36	336	3,432	2,444	
Education and Training	E	-	-	-	-	22	-	35	18	6	1,246	178	1,595
	S	-	-	-	-	59	-	88	48	16	13,163	543	14,914
	U	-	-	-	-	56	-	69	41	8	49,188	640	50,000
Health	E	99	45	16	55	311	25	86	98	3	8,921	353	10,210
	S	192	57	13	807	41	41	107	462	9	16,920	668	17,544
	U	955	1	6	1	40	733	5	5,639	69	28,071	1,370	31,445
Welfare	E	1	-	-	-	2	-	-	-	-	1,159	109	1,270
	S	4	-	-	-	16	-	-	-	-	5,475	1,016	5,495
	U	23	-	-	-	15	-	-	-	-	19,083	1,016	19,114
Administration and Organization	E	416	2,800	126	1,021	10,768	10,779	5,124	45,388	1,340	8,910	1,377	66,714
	S	889	4,615	274	2,308	52,023	20,076	18,266	24,283	37,936	37,936	18,553	114,027
	U	370	1,271	135	1,085	24,723	4,597	6,902	38,557	9,921	28,736	12,319	77,444
Research and Design	E	23	970	16	90	863	98	303	50	56	500	680	2,494
	S	98	1,243	49	1,072	10,648	1,139	3,379	1,083	548	4,535	9,904	17,998
	U	399	744	131	4,279	21,554	2,389	2,389	2,389	637	9,913	9,904	21,554
Total	E	329,285	70,268	24,060	31,776	435,411	221,893	199,250	227,084	13,062	142,723	85,205	1,799,318
	S	219,010	11,670	8,742	34,182	973,836	181,685	283,997	384,462	85,967	213,453	155,205	2,191,546
	U	12,526	7,371	322	9,424	86,810	14,903	23,673	73,508	24,982	154,583	38,123	451,526

(1) E - Elementary
S - Secondary
U - University

TABLE A-1

TABLE OF THIRTIETH/30th FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, CANADA (LABOUR FORCE, FEMALES, 1981)

Industry	Education Level	Agriculture	Forestry	Fishing and Transp.	Mines, Quarries, and Oils	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Finance, Insurance, and Real Estate	Committee, Public, and Personal	Public Administration	Total
Tools - Specialized	E	10	65	3	2	9,522	16	72	1,880	17	19,419	281
	S	7	21	1	3	6,842	13	60	2,795	17	11,732	21,735
	U	0	2	-	3	98	1	4	-	-	202	6
Tools - Non-specialized	E	145	115	36	192	13,306	358	486	7,427	177	9,930	21,494
	S	83	66	19	56	7,682	227	501	1,061	98	5,339	19,024
	U	4	3	1	1	98	6	11	46	14	100	13
Machines - Specialized	E	-	-	99	16	3,249	-	22	119	1	278	24
	S	-	-	45	7	1,922	-	54	111	-	215	64
	U	-	-	-	-	33	-	7	8	-	130	12
Machines - Non-specialized	E	175	9	48	29	87,706	86	217	5,064	-	581	78
	S	119	6	25	21	46,636	60	162	3,460	-	392	66
	U	1	-	-	-	436	1	1	34	-	4	678
Inspection	E	251	7	2	13	6,147	3	176	430	8	225	5,381
	S	225	16	9	73	6,155	9	458	871	19	800	7,364
	U	15	4	4	29	670	2	50	114	7	301	200
Vehicle Operation	E	-	7	-	-	71	6	194	132	6	197	400
	S	17	5	-	3	175	16	518	169	17	463	1,082
	U	1	-	-	-	8	1	22	47	2	21	-
Farm	E	41,817	6	-	-	46	-	1	7	-	95	3
	S	31,889	4	-	-	24	-	53	-	-	69	2
	U	976	-	-	-	1	-	-	1	-	2	-
Sales - Knowledge Required	E	3	-	-	1	292	3	24	133	10	99	12
	S	24	3	-	9	2,163	22	161	1,571	2,475	732	86
	U	1	-	-	1	133	2	12	311	251	55	7
Sales - Knowledge Not Required	E	66	2	-	6	2,013	40	80	15,171	29	1,676	68
	S	176	6	-	15	6,000	132	273	88,000	88	3,890	114
	U	18	-	-	-	265	12	14	2,968	-	255	3
Clerical	E	85	57	3	223	6,815	631	6,536	9,492	7,127	7,216	4,888
	S	53	712	88	3,399	77,545	7,635	59,749	81,276	87,021	8,172	470,810
	U	40	60	6	201	6,196	430	1,566	2,292	6,211	3,211	25,903
Personal Service	E	482	497	18	140	1,773	207	1,460	4,705	1,052	145,003	1,802
	S	406	361	15	132	1,506	150	1,332	4,552	886	119,383	1,212
	U	19	9	-	4	53	4	110	168	63	1,281	3,777
Entertainment	E	1	-	-	-	17	-	71	8	-	871	16
	S	2	-	-	-	337	-	368	100	5	5,904	86
	U	1	-	-	-	238	-	186	69	3	3,002	1
Protection	E	1	5	-	1	12	1	10	16	7	136	240
	S	1	10	-	2	64	2	28	72	16	358	1,383
	U	-	1	-	-	29	-	11	2	7	121	93
Education and Training	E	-	-	-	-	11	-	11	39	-	2,863	90
	S	-	-	-	-	10	-	17	15	1	67,364	1
	U	-	-	-	-	13	-	12	12	1	55,337	24
Health	E	16	1	-	4	148	5	35	-	-	18,401	209
	S	40	1	-	55	1,071	122	122	1,575	84	102,327	2,077
	U	23	-	-	10	358	5	64	710	-	25,785	106,199
Welfare	E	-	-	-	-	-	-	-	-	-	1,296	1,343
	S	-	-	-	-	-	-	-	-	-	7,256	1
	U	-	-	-	-	6	-	-	-	-	5,680	636
Administration and Organization	E	17	11	1	12	500	65	493	-	-	5,705	214
	S	109	30	4	64	2,283	363	3,365	10,215	1,177	13,057	42,710
	U	27	8	2	12	1,298	84	791	1,077	-	3,095	7
Research and Design	E	1	4	-	5	44	1	33	16	4	103	5
	S	9	12	3	37	366	80	117	171	11	846	1,157
	U	10	12	6	64	438	12	230	14	81	991	2,501
Total	E	43,076	782	210	972	129,475	1,619	10,329	65,750	1,179	213,756	7
	S	36,049	1,266	211	3,858	182,271	8,665	68,196	220,184	7,714	427,557	1,060,292
	U	1,149	86	17	313	8,161	559	4,071	12,973	1,171	100,552	16,880

(1) E - Elementary
S - Secondary
U - University

TABLE A-4

MATRIX OF INDUSTRY/JOB FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, PERCENTAGE DISTRIBUTION, CANADA LABOUR FORCE, 1961

[illegible]

(1) \mathbb{E} = Elementary

S = Secondary

U - University

TABLE A-5

MATRIX OF INDUSTRY/JOB FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, PERCENTAGE DISTRIBUTION, CANADA LABOR FORCE, 1981

Industry	Education	Agri-culture	Forestry	Fishing and Aquaculture	Miner., Quarries, and Oil Wells	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Trade	Finance, Insurance, and Real Estate	Public Administration	Total
Elementary	Secondary	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary	Elementary
Tools - Specialized	E 77.5 S 21.8 U 0.7	74.1 22.0 5.7	67.5 11.8 0.8	34.5 51.1 12.0	40.0 50.3 1.7	43.5 15.8 1.7	35.0 24.8 1.7	44.7 24.8 1.7	44.7 24.8 1.7	44.7 24.8 1.7	44.7 24.8 1.7	44.7 24.8 1.7
Tools - Non-specialized	E 4.4 S 36.9 U 1.7	48.9 39.3 1.8	44.5 11.7 1.7	47.6 51.2 2.0	50.7 67.7 1.0	7.0 67.7 1.0	36.0 61.0 1.0	55.0 42.5 1.0	55.0 42.5 1.0	55.0 42.5 1.0	55.0 42.5 1.0	55.0 42.5 1.0
Machines - Specialized	E 65.5 S 1.8 U 1.8	50.2 42.1 1.5	47.5 4.5 0.5	71.6 27.0 2.6	54.1 47.6 2.1	60.0 47.6 2.1	47.6 47.6 2.1	47.6 47.6 2.1	47.6 47.6 2.1	47.6 47.6 2.1	47.6 47.6 2.1	47.6 47.6 2.1
Machines - Non-specialized	E 51.0 S 61.1 U 1.8	55.1 4.5 1.7	75.8 23.6 1.8	40.0 50.2 1.8	51.0 47.6 1.7	51.0 47.6 1.7	66.7 51.0 2.0	47.6 51.0 2.0	47.6 51.0 2.0	47.6 51.0 2.0	47.6 51.0 2.0	47.6 51.0 2.0
Inspection	E 16.9 S 58.9 U 10.0	58.2 36.4 2.0	27.8 40.3 4.1	57.4 40.3 4.1	45.2 40.3 4.1	37.1 40.3 4.1	66.3 40.3 4.1	47.6 40.3 4.1	47.6 40.3 4.1	47.6 40.3 4.1	47.6 40.3 4.1	47.6 40.3 4.1
Vehicle Operation	E 59.0 S 46.2 U 6.7	57.6 61.1 0.6	34.3 41.3 1.2	57.5 41.3 1.2	51.2 41.3 1.2	59.1 41.3 1.2	49.0 41.3 1.2	47.6 41.3 1.2	47.6 41.3 1.2	47.6 41.3 1.2	47.6 41.3 1.2	47.6 41.3 1.2
Farm	E 19.1 S 19.1 U 1.4	41.0 35.1 1.4	41.0 35.1 1.4	41.0 35.1 1.4	66.3 35.1 1.4	59.7 35.1 1.4	40.8 35.1 1.4	47.6 35.1 1.4	47.6 35.1 1.4	47.6 35.1 1.4	47.6 35.1 1.4	47.6 35.1 1.4
Sales - Knowledge Required	E 39.8 S 37.9 U 6.3	47.1 38.0 9.5	47.1 38.0 9.5	47.1 38.0 9.5	47.1 38.0 9.5	47.1 38.0 9.5	47.1 38.0 9.5	47.1 38.0 9.5	47.1 38.0 9.5	47.1 38.0 9.5	47.1 38.0 9.5	47.1 38.0 9.5
Sales - Knowledge Not Required	E 17.7 S 70.1 U 12.0	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4
Clerical	E 9.0 S 79.1 U 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4	17.7 71.0 11.4
Personal Service	E 7.0 S 30.0 U 4.2	17.7 30.0 4.2	17.7 30.0 4.2	17.7 30.0 4.2	17.7 30.0 4.2	17.7 30.0 4.2	17.7 30.0 4.2	17.7 30.0 4.2	17.7 30.0 4.2	17.7 30.0 4.2	17.7 30.0 4.2	17.7 30.0 4.2
Entertainment	E 15.0 S 51.0 U 3.0	15.0 51.0 3.0	15.0 51.0 3.0	15.0 51.0 3.0	15.0 51.0 3.0	15.0 51.0 3.0	15.0 51.0 3.0	15.0 51.0 3.0	15.0 51.0 3.0	15.0 51.0 3.0	15.0 51.0 3.0	15.0 51.0 3.0
Protection	E 41.4 S 71.0 U 4.0	41.4 71.0 4.0	41.4 71.0 4.0	41.4 71.0 4.0	41.4 71.0 4.0	41.4 71.0 4.0	41.4 71.0 4.0	41.4 71.0 4.0	41.4 71.0 4.0	41.4 71.0 4.0	41.4 71.0 4.0	41.4 71.0 4.0
Education and Training	E 10.0 S 40.0 U 5.0	10.0 40.0 5.0	10.0 40.0 5.0	10.0 40.0 5.0	10.0 40.0 5.0	10.0 40.0 5.0	10.0 40.0 5.0	10.0 40.0 5.0	10.0 40.0 5.0	10.0 40.0 5.0	10.0 40.0 5.0	10.0 40.0 5.0
Health	E 10.0 S 10.0 U 2.0	10.0 10.0 2.0	10.0 10.0 2.0	10.0 10.0 2.0	10.0 10.0 2.0	10.0 10.0 2.0	10.0 10.0 2.0	10.0 10.0 2.0	10.0 10.0 2.0	10.0 10.0 2.0	10.0 10.0 2.0	10.0 10.0 2.0
Welfare	E 2.1 S 13.1 U 8.1	2.1 13.1 8.1	2.1 13.1 8.1	2.1 13.1 8.1	2.1 13.1 8.1	2.1 13.1 8.1	2.1 13.1 8.1	2.1 13.1 8.1	2.1 13.1 8.1	2.1 13.1 8.1	2.1 13.1 8.1	2.1 13.1 8.1
Administration and Organization	E 24.0 S 53.1 U 1.1	24.0 53.1 1.1	24.0 53.1 1.1	24.0 53.1 1.1	24.0 53.1 1.1	24.0 53.1 1.1	24.0 53.1 1.1	24.0 53.1 1.1	24.0 53.1 1.1	24.0 53.1 1.1	24.0 53.1 1.1	24.0 53.1 1.1
Research and Design	E 13.7 S 61.0 U 2.5	13.7 61.0 2.5	13.7 61.0 2.5	13.7 61.0 2.5	13.7 61.0 2.5	13.7 61.0 2.5	13.7 61.0 2.5	13.7 61.0 2.5	13.7 61.0 2.5	13.7 61.0 2.5	13.7 61.0 2.5	13.7 61.0 2.5
Total	E 46.3 S 44.0 U 7.2	46.3 44.0 7.2	46.3 44.0 7.2	46.3 44.0 7.2	46.3 44.0 7.2	46.3 44.0 7.2	46.3 44.0 7.2	46.3 44.0 7.2	46.3 44.0 7.2	46.3 44.0 7.2	46.3 44.0 7.2	46.3 44.0 7.2

(1) E - Elementary
S - Secondary
U - University

TABLE A-6

MATRIX OF INDUSTRY/JOB FAMILY EDUCATIONAL ACHIEVEMENT LEVELS, PERCENTAGE DISTRIBUTION, CANADA LABOUR FORCE, 1961

Industry Job Family	Education Level	Industry										Total	
		Agriculture	Forestry	Fishing and Trapping	Mines, Quarries, and Oil Mills	Manufacturing	Construction	Transportation, Communication, and Other Utilities	Trade	Finance, Insurance, and Real Estate	Community, Business, and Personal Service		Public Adminis- tration
Tools - Specialized	E	59.4	66.5	65.8	24.6	37.8	32.9	53.2	57.6	46.1	61.9	53.6	60.1
	S	40.2	31.9	33.9	75.2	41.6	43.2	44.0	41.5	49.6	37.5	44.8	39.2
	U	0.4	1.6	0.3	32.3	2.8	2.8	2.9	0.9	4.6	1.6	1.6	0.7
Tools - Non-specialized	E	62.4	62.5	62.4	63.2	63.1	60.3	63.3	52.4	64.0	63.8	63.7	62.0
	S	35.9	35.8	35.7	36.0	36.4	38.5	35.9	44.9	35.5	35.6	35.7	37.4
	U	1.7	1.7	1.9	0.8	0.5	1.0	0.8	0.7	0.5	0.6	0.6	0.6
Machines - Specialized	E	-	27.6	66.7	68.7	62.5	-	26.2	56.6	39.9	31.9	27.5	58.7
	S	-	69.5	31.3	31.3	36.9	-	65.3	39.0	59.0	61.1	60.5	38.0
	U	-	2.9	0.0	0.0	0.6	-	8.5	2.8	1.1	27.0	12.0	3.3
Machines - Non-specialized	E	59.3	57.9	66.0	57.3	64.2	58.1	60.2	59.5	-	59.5	52.7	63.9
	S	40.3	41.7	33.8	42.3	35.5	41.3	39.4	40.1	-	40.1	46.7	35.8
	U	0.4	0.4	0.2	0.4	0.3	0.4	0.4	-	-	0.4	0.6	0.3
Inspection	E	51.1	27.4	14.0	11.1	45.0	23.2	25.7	35.2	18.6	16.1	13.6	38.2
	S	45.9	56.3	62.0	63.4	49.9	64.9	67.0	55.4	66.5	62.6	62.6	53.3
	U	3.0	16.3	24.0	25.5	5.1	11.9	7.3	9.4	14.9	21.3	23.8	8.5
Vehicle Operation	E	27.1	26.4	11.1	18.2	28.0	26.9	26.4	17.7	11.4	23.7	15.6	23.2
	S	69.8	70.6	86.4	78.0	68.9	69.9	70.5	76.1	86.1	71.1	79.9	72.7
	U	3.0	3.0	4.5	3.8	3.1	3.2	3.1	6.2	4.3	3.2	4.5	4.1
Farm	E	56.0	56.3	-	42.5	57.3	42.3	57.7	57.8	-	57.0	56.1	56.0
	S	42.7	42.3	-	54.1	41.5	56.1	41.1	41.1	-	41.7	42.5	42.7
	U	1.3	1.4	-	3.4	1.2	3.4	1.2	1.1	-	1.3	1.4	1.3
Sales - Knowledge Required	E	11.1	9.6	-	10.3	11.3	11.9	12.1	12.1	14.2	11.2	11.1	12.4
	S	86.4	81.8	-	84.1	83.4	80.7	81.0	80.9	77.9	82.6	81.9	80.9
	U	4.5	6.6	-	5.8	5.1	7.4	5.9	7.0	7.9	6.2	7.0	6.7
Sales - Knowledge Not Required	E	25.5	28.3	-	27.7	24.2	24.2	23.8	27.9	23.9	26.2	28.3	27.6
	S	67.4	69.3	-	71.6	72.4	72.3	71.8	69.1	69.2	69.2	68.4	69.9
	U	6.9	1.8	-	2.1	3.2	7.4	3.7	2.3	3.0	4.6	1.8	2.5
Clerical	E	7.7	7.0	5.5	5.8	7.5	7.3	9.5	8.7	7.9	7.1	7.3	8.0
	S	87.5	88.1	88.6	88.9	87.8	87.8	86.8	87.0	87.5	86.7	87.5	87.2
	U	6.8	6.9	5.9	5.3	6.7	6.3	6.0	6.2	6.2	6.2	6.0	6.8
Personal Service	E	53.2	57.3	53.7	54.0	53.2	57.3	47.1	48.8	52.1	54.3	54.9	54.1
	S	46.7	41.6	45.2	44.5	45.2	41.7	49.4	49.4	43.8	44.5	43.7	44.8
	U	2.1	1.1	1.1	1.5	1.6	1.0	3.5	1.8	4.1	1.2	1.4	1.3
Entertainment	E	23.4	-	-	2.8	2.8	2.8	11.4	3.1	2.8	8.9	11.4	8.6
	S	59.5	-	-	54.9	56.9	57.2	56.9	57.2	56.9	58.4	58.4	60.9
	U	17.1	-	-	40.3	40.3	40.3	29.8	39.6	40.3	30.7	30.0	31.4
Protection	E	25.0	30.6	5.3	25.7	14.6	23.1	19.9	24.3	21.4	22.2	27.7	24.9
	S	69.6	62.5	63.6	61.2	51.6	59.1	57.0	60.0	57.5	58.2	63.1	60.5
	U	14.4	6.9	51.1	13.1	33.8	17.8	23.1	15.7	21.1	19.4	9.2	14.6
Education and Training	E	-	-	-	-	26.4	-	27.7	40.7	58.3	2.3	12.8	2.4
	S	-	-	-	-	42.8	-	42.1	36.0	27.6	51.6	51.2	53.4
	U	-	-	-	-	30.8	-	30.2	23.3	14.1	46.1	36.0	44.0
Health	E	18.0	27.5	-	5.9	9.4	13.3	12.8	5.2	5.9	12.6	6.8	12.4
	S	55.2	63.7	-	72.8	67.9	71.7	63.6	35.9	64.5	49.8	67.1	69.5
	U	26.8	8.8	-	21.3	22.7	15.0	23.6	58.9	30.1	37.6	26.1	18.1
Welfare	E	-	-	-	-	4.5	-	-	-	-	9.1	4.5	8.7
	S	-	-	-	-	34.1	-	-	-	-	51.3	34.1	50.2
	U	-	-	-	-	61.4	-	-	-	-	39.6	61.4	41.1
Administration and Organization	E	11.2	22.8	9.2	17.2	9.3	12.2	9.5	10.7	15.0	26.2	11.9	16.0
	S	70.7	61.2	63.6	64.0	66.6	72.1	75.4	71.1	67.7	59.8	59.2	66.6
	U	18.1	16.0	27.2	18.1	24.1	15.7	15.1	18.2	17.3	14.0	28.9	17.4
Research and Design	E	5.3	15.6	5.3	5.3	5.3	5.3	6.8	5.3	5.3	5.3	5.3	5.5
	S	43.6	41.6	43.9	43.6	43.6	43.6	43.6	43.6	43.6	43.6	43.6	43.8
	U	51.1	42.8	51.1	51.1	51.1	51.1	47.9	51.1	51.1	51.1	51.1	50.7
Total	E	55.0	36.8	48.0	12.1	43.2	13.3	12.5	21.9	10.7	28.7	11.8	28.4
	S	43.5	59.5	48.1	81.3	56.1	81.4	82.6	73.4	64.3	57.3	80.1	63.1
	U	1.5	3.7	3.9	6.6	2.7	5.3	4.9	4.7	5.0	16.0	8.1	8.5

(1) E - Elementary

S - Secondary

U - University



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